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Interchangeability has been made thoroughly simple, safe, and economical by Motor Wheel. Now it is easier, more profitable, *and quicker* to give the buyer exactly what he wants than to quibble about it.

MOTOR WHEEL CORPORATION, *LANSING, MICHIGAN*

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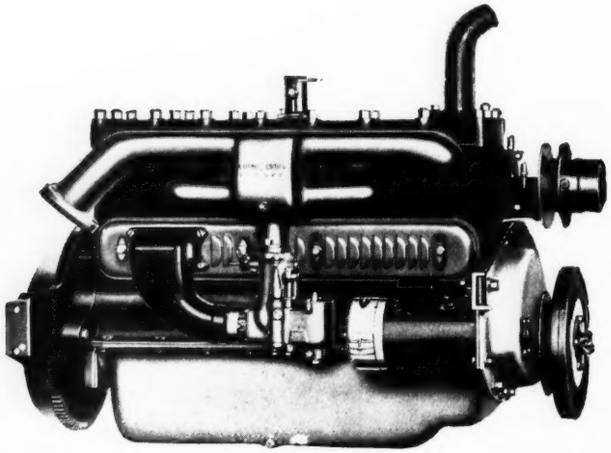
The standards in the Continental plants are so clearly defined that no deviations from the original models are ever made. Continental limits of precision are so exacting, the quality of workmanship so high, that Red Seal Continental Motors have attained a standard of performance which has given them an outstanding position in the gasoline power industry.

CONTINENTAL MOTORS CORPORATION
Offices: Detroit, Michigan, U. S. A. *Factories:* Detroit and Muskegon
The Largest Exclusive Motor Manufacturer in the World



Continental high standards are maintained through the accurate weighing of pistons as shown in view above.

Continental Motors

AUTOMOTIVE INDUSTRIES
VOLUME 56 *Philadelphia, Saturday, June 18, 1927* NUMBER 24

All This Talk About — SPEED

Subject much to fore now among motorists and manufacturers and scramble to supply demand for fast cars has led to some pretty strong performance claims.

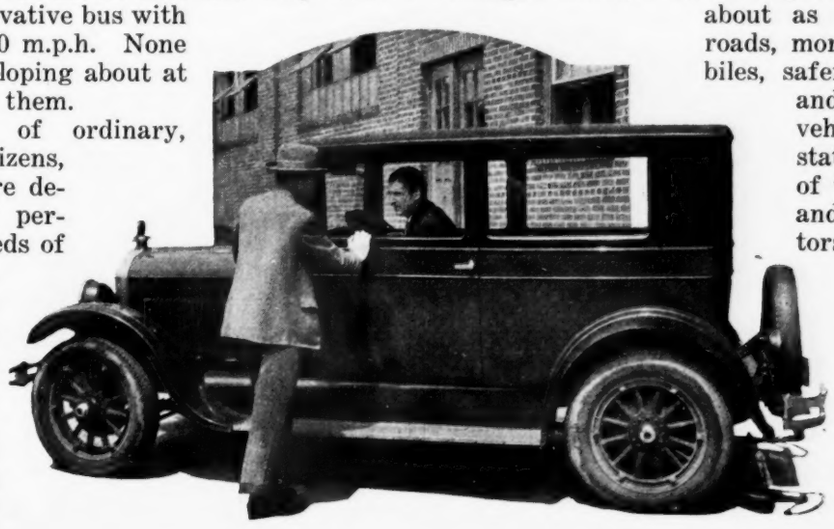
By Norman G. Shidle

WHAT'S the best you can get out of 'er?" That has been included almost inevitably among the more or less interested questions asked by admiring friends of the man with a new automobile. Even the most conservative and safe of drivers probably gets something of a thrill out of being able to answer that question with a figure just a few miles higher than his friend's car will go.

True there is still a very large and numerous group of automobile buyers who care little if nothing for speed, who neither seek nor get any thrill from flying over the open road, and who, in truth, take a certain pride in the fact that they drive a good, safe conservative bus with a top speed of 50 m.p.h. None of this giddy galloping about at high speeds for them.

The number of ordinary, every-day citizens, however, who are demanding easy performance at speeds of 50 to 65 m.p.h. and top speeds of 70 m.p.h. or more, is growing every day. Probably the proportion of this group living in the Middle and Far West is considerably larger than in the East, but that the number is growing can scarcely be doubted. And manufacturers in general are trying to meet the demand for cars in all price classes to perform more smoothly and competently at speeds higher than were usual for the given priced car a few years ago.

Naturally there has been something of a scramble among car makers to meet this demand and for this or that individual maker to try hard to convince people that his car meets that demand most fully. For the car builders have sensed the changed attitude toward speed which is coming about as a result of good roads, more durable automobiles, safer car construction and more comfortable vehicles. Drivers, state officials, students of the safety problem and traffic investigators all have finally



"What's the best you can get out of 'er?" is included almost inevitably among the questions asked by admiring friends of the man with a new automobile

recognized the fact that speed and unsafeness are not in any sense synonymous; that many factors other than speed *per se* are responsible for a goodly proportion of accidents.

The automobile is being used all over the country today by business men of every kind as a real personal transportation vehicle. Trips of 300 and 400 miles per day are common in the Middle West and Far West with almost perfect safety, under the conditions of road and vehicle provided. And fundamentally, it is this growing tendency of the ordinary man to get into his car and use it for cross-country transportation that is creating the demand for sustained speed with comfort and safety, far more than any pressure from the boys with the belltop trousers and the gin-fed flappers.

The current attitude toward speed necessities in motor cars was well evidenced by a recent discussion at the summer meeting of the S. A. E. when the engineers debated how the best and smoothest operation might be obtained at 50 m.p.h. And one manufacturer states in his advertising, probably with some slight exaggeration, "70 m.p.h. is as common as 40 used to be."

Featured in Advertisements

The matter of speed has got out of the purely engineering realm and into that of advertising and publicity in the last year or so. In the vigorous attempt on the part of each manufacturer to convince the public of his individual ability to provide best the new speed qualities which are being demanded, some rather strong statements have been propounded; some rather lavish claims have been made.

To say offhand that many claims have been exaggerated would, perhaps, be to take a hasty and unscientific view, but with at least three or four cars having claimed to be just about the fastest thing on wheels, it becomes apparent that everybody can't be right. We have heard of the "fastest car over the road," the "boss of the road," the "fastest stock car" and several others whose descriptions seem inevitably to be in conflict.

But the matter of speed claims does not lie solely in the matter of which stock car is the fastest; nor does the real question lie in that point at all. More important by far is the question as to whether each individual car can live up to the specific miles-per-hour claims made in the advertising which describes it. As a matter of fact, the speed claim situation simmers down into three separate phases:

1. General, sweeping claims of speed greater than that of competitors.
2. Specific claims of speed for the individual car.
3. Speedometer readings as related to actual speed in miles per hour.

The desirability of truth in advertising has been so well demonstrated and so often proved that it would be witless to labour the question further at this time. But even assuming the agreement of every executive in the industry as regards this fundamental, there are plenty of "ifs" and "ands" to be considered before a definite conclusion could be reached as regards each of the three phases listed.

Let's look at the first factor. Suppose the Comet claims to be the fastest stock car and the Marlborough claims to be the fastest car on the road. It would seem a simple matter to determine which statement was correct. Why not simply take a stock Comet and a stock Marlborough, put them side by side on a race track and see which one wins a race? That is one way, of course, and perhaps the best way practically available.

On the other hand, there are many factors entering into any such race which might affect one car more favorably or adversely than the other. The skill of the drivers certainly would be an important element. The care and skill of the mechanics in preparing the car for the race—even though the cars remained stock in every particular—the length of the race decided upon, the fortunes of tires and a multitude of other factors would enter in.

But suppose the race were held and the Comet won by some reasonable, though not overwhelming margin. What has been proved? It has been proved that stock car No. 245367 of the Comet production, under given conditions of tuning up, handling and fortune, was faster than stock car No. 675946 of the Marlborough production under given conditions. Change any one of the conditions and you might change the result.

The real difficulty lies, as we see it, in the sort of claims originally made; they were of such indefinite character as almost to defy scientific proof so far as the average car in the hands of the average owner is concerned. A more accurate picture would result from tests made of every tenth or every fiftieth or every one hundredth car coming off the production line with the results recorded and broadcast by unbiased official observers. The mean of such tests would probably come as near to truth as would be commercially possible from the standpoint of the average car driver.

After all, sweeping claims of superiority usually are difficult to prove and probably the industry as a whole, and even manufacturers individually, might be better off if they appeared less frequently in the future than in the past.

Specific Claims Dangerous

Now as to the second class of claims—specific claims of speed for the individual car. Unquestionably, the average car owner or prospect, when he reads in an advertisement that the Comet 6 will "hit '65' without effort" has a right to believe that if he goes to a dealer and buys a Comet 6 he will get an automobile which will hit "65" without effort. If the advertisement didn't mean that, it was misleading because that's the idea it will convey to 99 44/100 per cent of the people who read it.

If the advertisement meant that a Comet 6 equipped with supercharger, special rear axle ratio, special valves and operated on special fuel will hit "65" without effort, it certainly is a little less than truthful if it doesn't say so.

Even from a selfish point of view, the manufacturer probably is laying up trouble for himself in the long run if he makes claims in his advertising

which cannot be borne out in performance by the average car in his dealers' hands. There would seem to be little to be gained over a period of time by everlastingly trying to make a good story better by exaggeration. Perhaps the top speed of the Comet on a level road with the car in average good condition is 65 m.p.h. Hardly any car will do its top speed "without effort." It's hardly fair to add those words if "65" is the absolute maximum that can be got out of the car. Some advertisers do just that thing, however, as everyone who has driven cars after reading advertisements knows.

Claims Should be Proved

There have been so many claims and counter-claims as regards speed and so much actual disbelief in certain claims has arisen that it would seem both fair and desirable that speed claims be proved to the public. One car manufacturer urged the other day that "The place to prove speed claims is in official tests before the public." Whether or not every manufacturer would care to hazard public tests for fear of some unforeseen accident not necessarily related to the ability of the car, such proof as suggested would seem to be the most effective and courageous kind that could be offered.

Recognizing the difficulty of making a speed claim which will hold equally good for every car of a given make which comes off the production line need be no real hindrance to the making of true statements in advertising. The public will not quibble about fractions. The chief thing is whether or not the statement in the advertisement tends to convey to the reader the actual facts as they exist or whether, on the other hand, they tend, consciously or unconsciously, to mislead him.

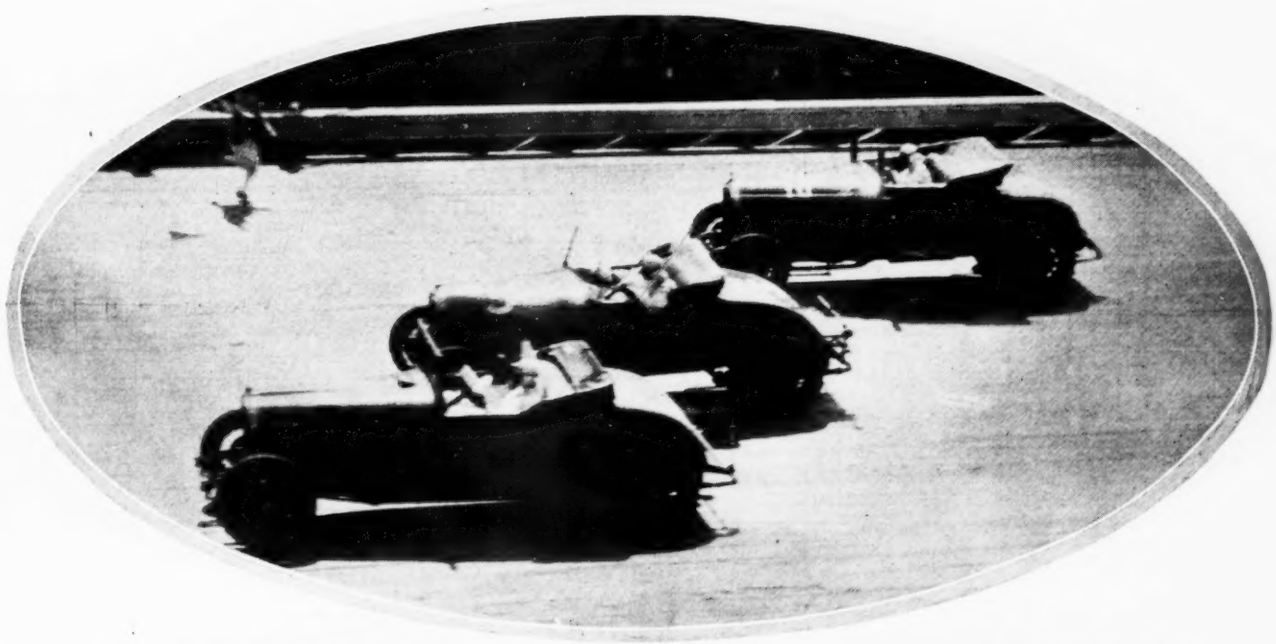
One manufacturer handled the speed claim question in a recent advertisement in a way which seemed to us quite sensible and convincing. Describing his new 6 cylinder model he says: "Top speed between 60 and 70 m.p.h." This relative statement probably is far nearer to conveying the true situation to the mind of the reader than a good many apparently more exact statements giving a single specific figure.

For every manufacturer to confine speed claims for his individual car to such speeds as actually can be obtained from the average car of the given make offers no real technical nor practical difficulties; it requires simply a sincere regard for and effort to attain accuracy in statement. Speed claims of this kind could easily be proved—and should be; officially where there is any doubt about it.

Stepping up speedometers so that they will register anywhere from 5 to 12 per cent more than the rate at which the car actually is traveling is, of course, known to be a practice commonly indulged in. Whether this practice has come as a result of speed claims greater than the car actually can fulfill, as a form of merchandising appeal, or as a means of increasing driver safety by keeping speed demons within more reasonable range is hard to tell. Probably each of these factors has had something to do with the practice.

Breeds Suspicion Among Owners

However laudable the motives behind it, however, the stepping up of speedometers does not promote the cause of accuracy and truth. Moreover, it centers arguments and attention among owners on this phase of their car because of the current interest in speed, and thus focuses their minds on something about the car or the maker which they more and more view with suspicion.



Stock car racing, which has been revived recently, is urged by some as one means of publicly checking speed claims. Here is the finish of the stock car race held at the Atlantic City Speedway last month

Swedish Tractor Has Two-Cylinder Two-Stroke, *Hot-Bulb* Engine

New design developed by Avancemotor of Stockholm follows American practice in general layout and is expected to become an important factor in export field.

THE sale of farm tractors in foreign countries has been hampered to a certain extent by the high price of fuels, particularly gasoline, and the importance of so designing the engines of these tractors that a cheaper grade of fuel can be used is apparent.

Recently European manufacturers of tractors have turned their attention to hot bulb and Diesel engines for this purpose. Sweden pioneered the use of hot bulb engines in the tractor field, a tractor with a single-cylinder, two-stroke, hot-bulb oil engine having been entered in the Shrawardine competition in 1921 by the Aktiebolaget Avancemotor of Stockholm. Recently this company has produced a more modern design of tractor with a two-cylinder engine of the same type, and we reproduce several drawings of the tractor and the engine from *Engineering* of London.

It will be seen that the designers have been inspired to a considerable extent by American practice, especially in the general layout of the tractor. That the machine is likely to become an important factor in the export market is indicated by the fact that it was awarded the first prize, a gold medal, in a competition held in the Argentine. The following data on the tractor are abstracted from a descriptive article in *Engineering*.

It will be seen from the longitudinal sectional view that the tractor is of the frameless type, the various casings being flange-bolted together and a separate frame dispensed with. The engineering rating is 30 hp. at 625 r.p.m., but it is said to have an overload capacity of 10 per cent. Two forward speeds are provided, the higher speed being intended for all ordinary plowing up to 10 in. in depth, and the lower one for plowing in exceptionally heavy soil, with a three-bottom 12 in. plow. It is claimed that up to 11.6 acres can be plowed in a 10-hour day, and that the fuel consumption is ordinarily 2.14 U. S. gal. per acre and never over 2.46 U. S. gal.

A large proportion of the weight of the tractor is in the driving wheels and the weight distribution is such that there is no appreciable slipping of the drivers even when plowing under the most unfavorable conditions. All important bearings are of either the

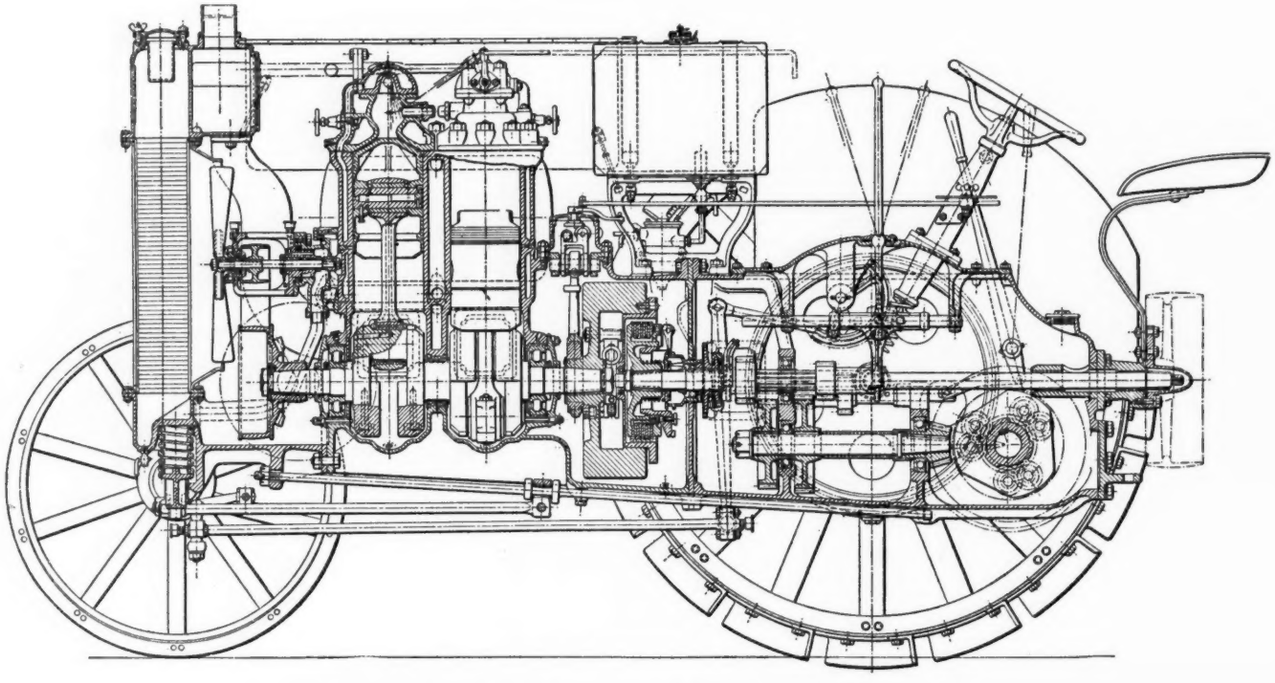


Fig. 1—Longitudinal section of Avance heavy oil tractor

ball or roller type. To minimize the shocks to the powerplant when driving over roads, the front end of the engine is supported on the front axle through the intermediary of a coiling spring.

The two cylinders are in a single casting to which the separate cylinder heads are secured by studs and nuts. The air taken into the cylinders is precompressed in the crankchamber which is made to form two chambers completely separated from each other and each provided with an air inlet valve mounted in a separate casting. Before entering the crankcase, the air is preheated or warmed by being passed through a chamber in the upper part of the radiator. Air is drawn into this chamber through a pipe extending upward a sufficient distance to bring its opening well above the dust clouds sometimes formed in plowing and in addition an air filter can be fitted into the radiator air chamber if desired.

The spray valve at the top of the bulb can be rotated on its axis by means of a system of levers and rods, terminating in a handle at the inner end of the fuel tank, within convenient reach of the driver (Fig. 1). When the engine is first started up the spray is directed on to the inner end of an ignition plug projecting through the cylinder wall. The outer end of the plug is heated by a blow lamp before the engine is started.

The plugs for the two cylinders face each other, as shown in Fig. 1, and the flame of the blow lamp, the burner of which is shown to the left of the head in Figs. 2 and 3, is directed equally on the two ends, one lamp thus serving for both cylinders. After the engine has been running a short time, the lamp is extinguished, and the spray valve turned to direct the fuel jet vertically downwards into the center of the bulb. Once the engine is running without external heat, it will continue to do so satisfactorily even on no load.

Water Injection Not Used

Water injection is not employed under any circumstances. It will be noticed in Fig. 1 that the cover above the spray valve is water-jacketed, the water being supplied through a pipe connecting this jacket space with the top of the cylinder jacket. The connecting pipe is fitted with a cock, and this is closed when starting up the engine, to reduce the time required to enable the bulb to reach a temperature sufficient to dispense with the starting lamp. The outside view of the head, given in Fig. 3, shows

Fig. 2

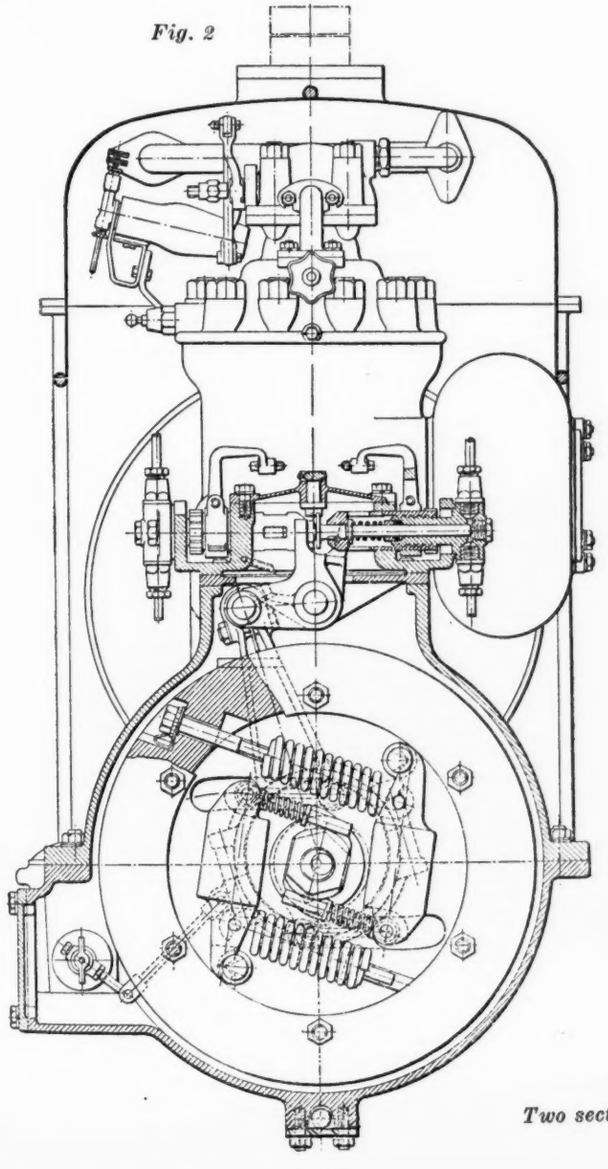
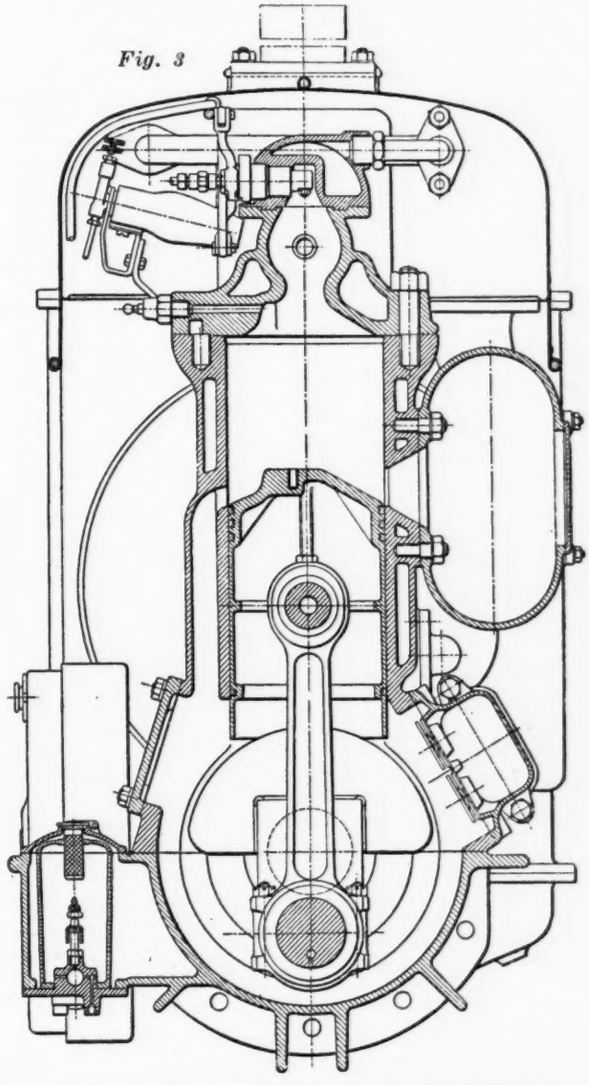


Fig. 3



Two sectional views of Avance two-cylinder, two-stroke, hot bulb type of tractor engine

the cock and connecting pipe in end elevation.

Circulation of the water through the jackets and radiator is effected by means of a centrifugal pump mounted on the inner end of the fan-shaft. This pump is shown in section in Fig. 1, and the connections from the base of the radiator to the pump inlet, and from the jacket of the atomizer cover to the top of the radiator, can also be clearly seen in the same figure. The pump and fan-driving shaft is mounted in an eccentric bush to take up any slack which may develop in the belt.

Fuel Pumps and Governor

The fuel pumps and governor are shown in Figs. 1 and 3. From the former will be seen that the eccentric for driving the pumps is mounted on the crankshaft immediately in front of the flywheel. The eccentric rod is shown in Fig. 3 coupled to the horizontal arm of a bell-crank lever. The vertical arm of this lever is forked, the forks being offset in plan, so that the inner side of each can bear on the end of one of the pump plungers. The two pumps are mounted parallel with one another, but facing in opposite directions.

To vary the quantity of fuel injected the length of the plunger stroke is regulated by a stop bearing on a collar on the plunger stem. The stop is formed on the end of a sleeve with an internal thread. The latter engages with a corresponding external thread on the pump body, and a lever, coupled by a rod to the control lever in the cab, is clamped over the sleeve. Movement of the control lever will thus cause the sleeve to rotate, and the length of the pump stroke is correspondingly altered. Independent adjustment of the pumps can be made by slacking off the nut holding the lever on the sleeve, and turning the latter by the milled head provided on its outer end.

A lever, shown in Fig. 1, is provided for working the pump by hand for injecting a charge before starting the engine. This lever is pinned to a short vertical shaft passing through the cover at the top of the pump casing. At the base of the shaft is a flat disk in which are two pins. When the hand lever is moved these pins make contact with the ends of the plungers and thus operate the pumps.

Details of the governor are shown in Fig. 3. It is arranged to vary the length of the stroke of the fuel pumps, according to the load on the engine. Lubrication is by the force feed system, the oil pump being driven through a rod connected to the fuel pump eccentric (Fig. 3).

All transmission parts are inclosed in dust-proof casings. The clutch is of the multiple disk type and is operated by means of the hand lever below the steering wheel. The two forward and one reverse speeds are obtained by means of clash gears. There is no direct drive. From the end of the secondary shaft the power is taken through crown and bevel gears to the differential shaft, from which the power is transmitted to each road wheel separately by spur gearing. The differential is self-locking under heavy loads.

General automobile practice is followed in the design of the steering mechanism. The worm and sector at the base of the steering column are inside the gear-case, hence they are effectively protected and lubricated. The engine is started by means of a starting crank on the near side of the tractor. The shaft on which this crank is mounted terminates in a bevel wheel engaging with the wheel behind the fan-driving pulley shown in Fig. 1. A brake is fitted on the differential shaft. The fuel tank has a capacity of 20 gallons, and supplies the pumps by gravity.

The tractor can be used for driving farm machinery by taking off the bracket which supports the driver's seat, when a belt pulley can be mounted on the end of the main transmission shaft, which is extended through to the back of the chassis for this purpose, as shown in Fig. 1.

The motor can be supplied either with 54-in. iron wheels for agricultural service or with 47-in. Rubber-tired wheels for road service. Six different combinations of gears are available, the standard combination for agricultural service giving forward speeds of 2.9 and 2 m.p.h., and a reverse speed of 1.4 m.p.h. For road service, the standard speeds are respectively 5.7, 2.7 and 1.9 m.p.h. With special combinations a plowing speed of 4.4 m.p.h., and a road speed of 7.1 m.p.h., can be obtained, both these being of course on top gear. On a series of brake tests on the engine, using crude oil of 0.860 specific gravity and having a caloric value of 17,300 B.t.u. p. lb., the fuel consumption was found to be 1.27 lb. p. hp.-hr. when the engine was developing 5 b.h.p. The consumption fell as the power was increased until it was only 0.51 lb. p. hp.-hr. at 25 brake horse-power, a slight rise taking place subsequently to 0.55 lb. at 35 brake horse-power.

In plowing tests on heavy land, which had not been cultivated for eight years, average results taken over a fortnight gave the following figures. Drawing a four-bottom 12-in. plow, and plowing to an average depth of 7 in., a self registering dynamometer applied to the draw bar registered a load of 4560 lb., with a brake horse-power of 18.5. These results were obtained on the first speed, the fuel employed being Russian masut with a specific gravity of 0.920. On second speed, the maximum load was 3200 lb. and the brake horse-power 21.5. Measurements were taken of the slip as a percentage of the driving speed obtainable if the wheels were running on the tops of the grips, and it was found that as the load was increased on first speed from about 100 to 4560 lb., the slip gradually rose from about 2 to 25 per cent. On second speed, the slip followed the same curve until the load was 2500 lb., and it then rose more rapidly to 25 per cent with a load of 3200 lb.

WRITING on the subject of gas generators for motor trucks in *Le Poids Lourd*, M. J. Jagerschmidt, French Inspector General of Streams and Forests, says the troubles at first experienced by users of producer gas, such as loss of time in starting and at the completion of a trip, and fouling of the engine, have now been eliminated. The processes of gas purification are now sufficiently effective so that the care of the powerplant is no more troublesome than in the case of a gasoline engine; it does not take more than 5 to 6 min. to get the engine started in the morning, and the weight of the generator has been reduced to 660 lb. and in some cases even 330 lb. which is not excessive for a delivery wagon and negligible in the case of a heavy truck. There is only one remaining difficulty, and that is the reduction in engine power. Various remedies are resorted to—either a supplementary supply of gasoline on hills, compressing the gas upon its arrival at the engine (supercharging) or the use of a larger engine. This is the problem which is now occupying the manufacturers of producer gas vehicles.

New *Heights* Reached *by* Canadian Industry *in* 1926

Statistical picture presented by Department of Trade and Commerce shows healthy growth in all departments. Total production for year 204,727 vehicles.

OFFICIAL production of the Canadian automotive industry for 1926 was 204,727 motor vehicles, which represents a 26 per cent increase over 1925, 55 per cent over 1924 and 39 per cent over 1923. The 1926 output was made up of 154,061 passenger cars, 30,440 trucks and 20,226 chassis valued in the aggregate at $122,629,537 at factory selling prices. Parts and repairs worth $10,969,000 brought the total production value for the industry to $133,598,000, some $23,000,000 more than 1925 and $45,000,000 more than 1924.

This is part of a comprehensive statistical picture of the Canadian industry contained in a bulletin issued by the Department of Trade and Commerce, Dominion Bureau of Statistics.

Eleven concerns were engaged in making automobiles during 1926, which was the same number in active production during 1925 and also during 1917. The largest number of concerns were in operation during 1920 when 17 were producing cars and trucks. Capitalization of these 11 concerns for 1926 was $82,792,000, about $8,000,000 higher than last year and a record for all time past.

Number of employees increased some 1600 during 1926 to 11,905 while total wages paid that year were $19,651,000. Total cost of materials used in production was $89,372,095 in 1926 or about $15,000,000 more than in 1925, the previous high point.

Of the total passenger car production, touring cars made up about 40 per cent. sedans 44 per cent, coupes 10 per cent, roadsters 5 per cent and special cars 1 per cent. There were 127,210 four-cylinder cars produced, 26,711 six-cylinder, and 140 eight-cylinder. Closed cars made up about 55 per cent of total production as compared with 40 per cent in 1925 and 32 per cent in 1924.

Of the total truck production, 6015 were under 1 ton, 23,737 were rated at 1 ton, and 688 over 1 ton but under 5 tons. Only 13 were six-cylinder while 30,427 of the total were fitted with four-cylinder engines.

The average selling price of passenger cars sold during 1926 was $659 as compared with $661 during 1925. The average truck price was $478 in 1926 and $509 in 1925.

Since 1924 the total capital invested in the Canadian industry has increased from $60,767,000 to $82,792,000, but practically all of this increase has been brought about by increases in material accounts and trading and operating accounts. The total cost of land, buildings and machinery has remained nearly constant during this period, as has also the estimated capacity of the plants, which is now about 265,000 passenger cars and 27,000 trucks per year.

Imports during 1926 were 26,345 cars and 2199 trucks, considerably greater than in any previous year. Of these Great Britain supplied 115 cars and 74 trucks, and the rest of the world except United States 7 cars and no trucks. Total value of imports, including parts, was $51,847,000.

Passenger car exports from Canada in 1926 totaled 53,628, somewhat fewer than in 1925 but greater than during any other year except 1923. Truck exports amounted to 20,696, well above the previous high of 16,146 registered in 1925.

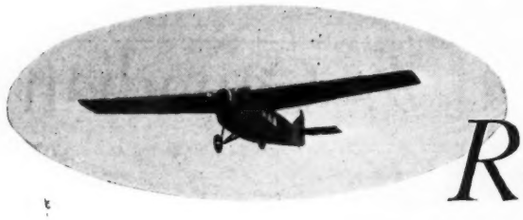
Total Canadian registrations of motor vehicles were 836,794 in 1926, which represents an increase of 15 per cent over 1925. All provinces but one impose a gasoline tax and during 1926 $6,360,690 was collected from this source and $15,434,494 from registration fees. The import duties for the fiscal year amounted to $12,715,000 and excise duty was $3,475,000.

The average number of persons per motor vehicle in Canada in 1926 was 12.8 as compared with 14.7 in 1925. Automobiles are densest in Ontario, where there are 10.2 persons per vehicle.

Total sales to Canadian consumers are estimated at 158,577 vehicles in 1926, as against 102,110 in 1925.

Photo Courtesy of Canadian National Rys.

A street scene in Quebec



Recent Events Prove America *Supreme* in Many Phases of Aviation

Question of "What's wrong with American airplanes and American commercial aviation?" answered with emphatic statement that nothing is wrong. Progress has been swift.

*By Edward P. Warner**
Assistant Secretary of the Navy for Aeronautics

AVIATION in the United States has been too long under the spell of an illusion. The belief has been all too widely held that we in this country are in some way greviously laggard; that we have failed to take advantage of our opportunities; that our aeronautical activity suffers by comparison with that of foreign lands.

We have been favored with a long succession of jeremiads from prophets of gloom who have painted an ominous picture of allegedly existing ruin and allegedly impending disaster. We have been too much under the spell of the calamity-monger, whose dire and awful prophecies have gained by their very somberness an attention more respectful than mere asseverations unbacked by citations of evidence are ordinarily considered to deserve.

It is time that we should revolt—not against that just criticism which is and always should be welcomed, but against sweeping declarations unfounded on fact and unproductive of constructive suggestion. It is time that we should at least look with initial scepticism upon, and demand credentials of specific fact from, the man who is unconcerned with availing himself of the fruits of the practical usefulness of aircraft because he is too busily engaged in throwing rocks at the trees that bear those fruits.

It is time that the questioner who mournfully asks "What's the matter with American airplanes?" "What's the matter with American commercial aviation?" and so on, should be boldly challenged to provide a valid answer to his own queries.

For myself, I answer them without hesitation. I say that nothing is fundamentally wrong or fundamentally lacking, and that that assertion may be backed by as much statistical and other evidence as may be desired. I might say that nothing at all was wrong, were that not to imply that there is no room for improvement, and it goes without saying that neither in this country nor in any other has that stage been reached, nor will it ever be.

The most recent, and among the best, of all proofs that American flying equipment and American aviators stand in the van of progress has been furnished by Capt. Charles A. Lindbergh, who set his face toward the rising of one sun, and the rising of the next saw him already approaching those European shores which he was triumphantly to attain before that sun had set behind him. And Captain Lindbergh, American-born and American-trained, wrought this magnificent feat into reality with an airplane of purely American conception, built in an American factory and powered with an American engine, while navigating instruments of native invention and construction served the pilot in holding him as true to his course as the magnetic needle to the magnetic pole.

America Holds Many Records

The record which Captain Lindbergh established is by no means the only one which stands to the credit of American industry and American pilots. World's records for performance may at times have little practical significance. They may be little more than a show-window, a sort of frosting on top of the cake of solid achievement. The failure to hold them in a given country may mean nothing more than that they have not been the subject of any intensive effort or of any effort at all, but when they *are* held, and particularly when those records which have been the subject of keenest international competition are broken, real quality in the record-breaking machine is evidenced.

There has been no intensive drive against record figures in America, and there have been very few efforts to build machines for the particular purpose of record-breaking in the last three years. Bearing that in mind, we need feel no dissatisfaction that, in spite of the much more intensive interest in that particular sort of flying recently displayed in certain

* A paper presented at the National Commercial Aviation Conference, St. Joseph, Mo., June 6, 1927.

other countries, the United States holds more than one-fifth of the world's records for seaplanes and landplanes and almost a third of those for seaplanes alone, while holding a considerably larger share than that of the records bearing closest and most direct relation to some commercial or military service, such as those for distance in straight line without stop, for duration, and for performance with a reasonable amount of dead load representing freight or military equipment. Both for landplanes and seaplanes, in fact, the records for duration and for straight line distance all abide in this country.

Able to Meet Any Problem

It would be foolish and vain, of course, to maintain any inherent and natural superiority for American products. Other nations have had their triumphs in the fields of their special interest, as we have had our own. It is, however, perfectly possible and altogether reasonable to maintain with full confidence that American aircraft designers and constructors have given proof of their ability to cope with any specific problems set before them at least as successfully as those of any other country. If they specialize on the breaking of records, they will make good in that field. Specializing on the production of commercial, military, and naval airplanes of various types they are showing themselves competent to meet the requirements imposed.

It can be soberly said, and a study of recent history or of the present status of affairs will justify the statement, that the record of American airplanes taken as a whole, especially in the last two or three years, has been approached by few of their competitors and excelled by none.

Of American achievement in the operation of aircraft it is possible to speak with equal pride. Of the success gained in commercial operation many of you, and particularly those who dwell in St. Joseph, see daily evidence, but I refrain from enlarging upon that, and so encroaching upon what is the proper domain of my colleague, Secretary MacCracken.

More directly within my own province is the record of sea-going aviation, and anyone associated in any capacity with the Navy Department must recall with pride that it was in the United States that real progress first began to be made towards the carriage of airplanes on combatant ships and in the United States that the airplane first regularly established itself as a normal and indispensable part of the complement of equipment of battleship or cruiser, so that now, instead of being limited to specialized aircraft carriers, we are able to send airplanes to sea with a score or more of vessels.

At the same time the Langley, the experimental carrier which has been in service for several years, flies its 20 or 30 airplanes off the deck and on again with the regularity of clockwork. Close to 4000 landings have been made on the flying deck, some of them with the ship pitching so that its stern moved up and down for many feet as the plane approached, without a single serious injury. That splendid record of safety stands by no means alone, for although the requirements of service operation must take precedence over an extreme of caution, the figures for the years since the war give encouraging indications that the hazard of naval aviation is steadily decreasing and so far as data for foreign countries are available, comparison again goes to show the American service, in safety as in efficiency, in a leading position.

With good material available, with the relations between service and industry so adjusted that it is possible to look forward with confidence to a steady improvement in the quality of the designs produced for aircraft for each specifically naval function, the problem of procurement in adequate quantity and of periodic replacement becomes the center of attention. The Navy Department is carrying forward its plans in accordance with the five-year program enacted into law in the summer of 1926. We have definitely turned our backs upon equipment of wartime design or construction, and we have now on hand a total of approximately 900 airplanes, of which just over 500 are classed as non-obsolete and of such characteristics as to be useful in time of war. Of that 500 all have been constructed within the last six, and three-quarters of them within the last three years, and the number is to be swollen by the delivery of some 300 machines now on order.

Navy Flies 100,000 Hrs. Per Year

The scope of the activities of naval aviators can be at least vaguely realized from the fact that the flying time for the year ending on the last day of this month will total, as nearly as can now be estimated, 100,000 hours, equivalent to a distance of once around the earth at the equator for every day in the year, and an increase of 60 per cent over the figure for two years ago. So vast a mass of experience has valuable lessons to teach, not merely for naval aviation but for every other sort of aerial operation as well.

The relation between naval and commercial aviation is naturally intimate, even as is that between the Navy as a whole and the sea-going commerce of the United States.

A scene that is becoming increasingly common on American flying fields—the coordination of land and air transport facilities

The annual expenditures for experiment and research in naval aeronautics average $1,750,000 a year, and by far the larger part of that sum is devoted to studies of materials and methods of assembling them, of the construction of airplanes and airplane engines, of which the final results are as directly applicable to civil as to naval equipment. Furthermore, the $12,000,000 or thereabouts which the government annually expends upon the procurement of naval aircraft of service types goes to keep up an industry which is making constant trial of those new methods and which, having its overhead cost largely sustained by government orders, has been able to make to the private purchaser a price correspondingly lower than would otherwise have been possible.

All Use Same Powerplants

The last element is felt with particular strength in its application to powerplants, which are identically the same on military and commercial machines, and one may well hesitate to estimate the price that would have to be set upon the air-cooled engines now so extensively used on aerial transport and aerial service machines if the burden of their development had not been so largely carried by naval researches and by naval orders to the manufacturers. The air-cooled engine is a specific and a very notable example of the profit derived by commercial aviation from military and naval precedents, but others could be multiplied at will.

The profit is mutual. If it is true that the price of engines to the commercial purchaser has been lowered by virtue of the existence of the governmental demand, so also is it equally true that the gradual growth of the commercial market is stabilizing the industry, making it possible to extend plant facilities, establishing on a firmer footing the factories which would have to be called upon for enormously and suddenly increased production in the event of war, and in the meantime, under peace conditions, lowering the price which the Navy, and so ultimately the taxpayer, must pay for the powerplants installed in service machines.

During less than five per cent of the time of the last half century have we been engaged in naval operations against other powers, but there has not been a year or a week within that time in which the Navy has not been rendering service to American commerce, to individual Americans, or in the interests of general humanity.

The first function, the one which must be kept over to the fore, is readiness for war, but if maintaining the organization in a state of readiness and developing the material necessary to that end involves also readiness to save life at sea, readiness to protect peace and good order when need arises, and experiments to improve marine machinery and radio equipment available for merchant vessels and other purposes, those and other activities which would demand accomplishment through some channel in any instance stand as so much clear gain on the naval account. Similarly and reciprocally, if the development of commerce in itself brings results favorable to the national defense, so decreasing the load having to be carried for purposes of the defense organization alone, that too stands as a credit item on the books of the nation.

All this has a very direct bearing on commercial aviation, for the development of the naval airplane has brought with it as an incidental benefit quite unforeseen in the earliest stages, services of incalculable value to commercial aviation. Commercial flying itself, on the other hand, returns the compliment by strengthening naval and military aviation and so reducing the financial burden of their maintenance. The operation of aircraft in transport and in other commercial service can justify itself on purely economic grounds but its contribution to the military and naval preparedness of the nation is an additional asset by no means to be neglected.

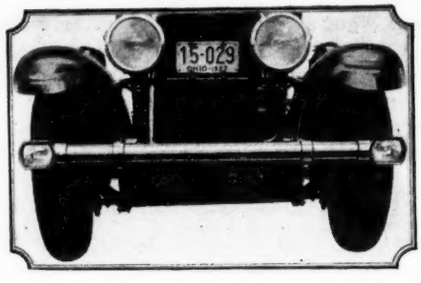
The importance of military aviation as a training school for commercial pilots, and of commercial aviation as a reserve for call to military or naval service in case of extreme need, is no less than their mutual importance in matters of material. I need not expand the connections or further discuss them in detail, for they are too obvious to require it. My audience can fill in the gaps for themselves, and each additional link that appears to bind together the interests of those engaged in the various types of flying furnishes an additional reason why commercial aviation, aside from the general desirability of improving the national transportation system, has a direct bearing upon the national defense.

It furnishes reason, furthermore, why those who are coming to make use of the airplane so much as a matter of course and who have learned to appreciate commercial operation of aircraft for its own sake, for its value in business and everyday life, ought to watch with the keenest interest what is going on in the services and ought to feel themselves possessed of a direct concern in the work that the Navy is carrying on in the development of aircraft suitable for specifically naval needs and in their direct application to naval operation.

Bumper Has Safety Road Lights

THE "Bright Bumper," a new combination of collision protection and safety road lighting has been announced by the Warren Tool and Forge Co., of Warren, Ohio. The bumper itself is distinctive in appearance and practical in design.

The road lights are set into the ends of the bumper in such a way that lens, bulb and glass are protected from breakage. Should breakage occur to these parts, replacements are made gratis. The road lights provide illumination for night driving. Because the light beam is never more than 18 in. off the road, there



Car equipped with Bright Bumper

is no glare. As the lights in the "Bright Bumper" are in the ends, directly ahead of the tires, they cause approaching drivers to give a wide berth for passing and reduce the possibility of side swiping.

Bright Bumpers have been tested and approved by the National Board of Underwriters, and a saving of 12½ per cent on collision insurance is effected through their use. For the rear of the car, "Bright Tubular Bumperettes" that harmonize with the front assembly are provided.

Just Among Ourselves

Next Six Months Causing Little Worry

FAR less worry is being caused this year by speculations about business for the last six months than was the case last June. With a first half year that has been about 10 per cent off for a majority of manufacturers, a good deal better than last year for a few and a good deal worse for a few others, there seems to be general confidence in continuance of sales at a reasonably good rate for the remainder of the year. Price trends will have a strong bearing on the net profit results, of course, while the character and success of the new Ford models will be an important factor in determining output totals for the 12 months. Despite the tremendous importance of a new Ford car for the first time in many years, it is worth remembering that the Ford product probably won't have any immediate effect of importance on the business of any manufacturers except those very directly competitive. Naturally, a very keen watch is going to be kept by everyone as to its effect there.

* * *

Outlook is for Fair But Not High Profits

SO far, 1927 business has been turning out very much as expected. Plenty of companies are making satisfactory profits, both in the parts and complete vehicle branches, but only a few have been able to reach 1926 levels in this respect. Strenuous efforts to continue to lower costs have resulted in further pressure on parts makers to pare down prices and some executives in vehicle plants have been frankly surprised at the degree of concessions which they have been able to get from suppliers in certain instances. The practice of taking big orders without profit in the hope of future profits has not yet passed out of the parts merchandising scheme, although there is a good deal less of this than there was a few years ago. The outlook for the rest of the year seems to indicate fair but not high profits, and normal but not record-breaking output levels, generally speaking, with the intelligence and efficiency of individual shop and marketing practices playing a predominating role in determining the success of specific companies.

* * *

If You Have Something to Say, Say It

WE'RE always interested to see people practicing what they preach, since we find it so difficult a task personally. H. B. Lewis in the first of his "Automotive Observations" bulletins for the Commercial Credit Companies, hands out a brief bit of advice to dealers that strikes us as worth application to writers and speakers among the manufacturing and engineering branches of the industry as well. "Whether you write or speak," Lewis urges, "be simple—natural—if you hope to be believed. Don't wind about Robin Hood's barn and come by artful psychological twists to the primary issue. Out with it." Which seems to us good advice couched in terms which exemplify their content.

* * *

The Retailer's Life Isn't Bed of Roses

IF some of the automobile dealers of this country sat down and wrote autobiographies they could certainly unfold many tales which would make J. Rufus Wallingford's nerve look puny. A Philadelphia distributor, for instance, just told us of a man who came into his retail store the other day and said: "I'd like to buy two of your cars, but I want a car to go to Cape May in right away." This distributor told him he'd have to have a deposit of $200 on each of the cars, as he couldn't provide so long a demonstration tour on general principles. "That's all right," the prospect replied. Then he sat down and wrote out two $200 checks without blinking an eye. A car and driver were provided for him. He and his family were transported to Cape May and later to Wildwood. Next day a telephone message came from the driver saying the deal was all wet; also a telegram from the prospect saying "Please do not cash checks; have changed my mind." Later investigation proved that the gentleman was looking for a job as a hotel clerk and wanted free transportation in a $2,500 automobile.

* * *

Critics of Advertising in Best-Seller Class

APROPOS of the activities of critics of consumer advertising discussed by K. W. Stillman in last week's issue of *Automotive Industries* it is interesting to note that "Getting Your Money's Worth" has been chosen by the Book-of-the-Month Club for distribution in July to its more than 40,000 members. This widespread distribution, besides the regular book store sales, which may well be augmented by the discussions the book is almost sure to provoke, will put the ideas of Messrs. Chase and Schlink directly in the "best seller" class. Of the four sources of criticism mentioned in the article, this book is written most from the consumer's viewpoint.
—N.G.S.

Material-Handling *is* Minimized *in* Plant Layout

Straight-line movement of all materials through production processes at Parish Pressed Steel factory accomplished by the use of only seven overhead cranes.

By K. W. Stillman

STRAIGHT line movement of all materials through the production processes at the Parish Pressed Steel Company's plant at Reading, Pa., has been made possible by a very carefully prepared layout for the factory buildings. Possibly the most interesting feature of this result is that raw materials are brought into the plant and passed through the various processes of annealing, blanking, forming, hardening, drawing, sandblasting, straightening, assembling and painting to the shipping platform with the sole help of but seven overhead traveling cranes. The plant has been laid out purposely for obtaining most effective movement of materials, but this result has been obtained somewhat paradoxically, with an absolute minimum of material-handling equipment.

The Parish Pressed Steel Co. specializes in the production of motor vehicle frames of large size such as are used for buses and trucks, so that the materials, equipment, and other manufacturing facilities employed are all of very heavy character.

The factory building proper is about 650 ft. long and 200 ft. wide; a single-story structure divided longitudinally into a number of bays of alternating heights so that natural illumination in the interior is exceptionally good. Production processes are laid out to pass along one side of the building, across the back and up the other side, the center portion of the building being given over to offices and miscellaneous machine operations, while on a mezzanine over the center portion are grouped the tool room and machine shop for machining spring hangers and similar small parts.

Railroad at Each Side

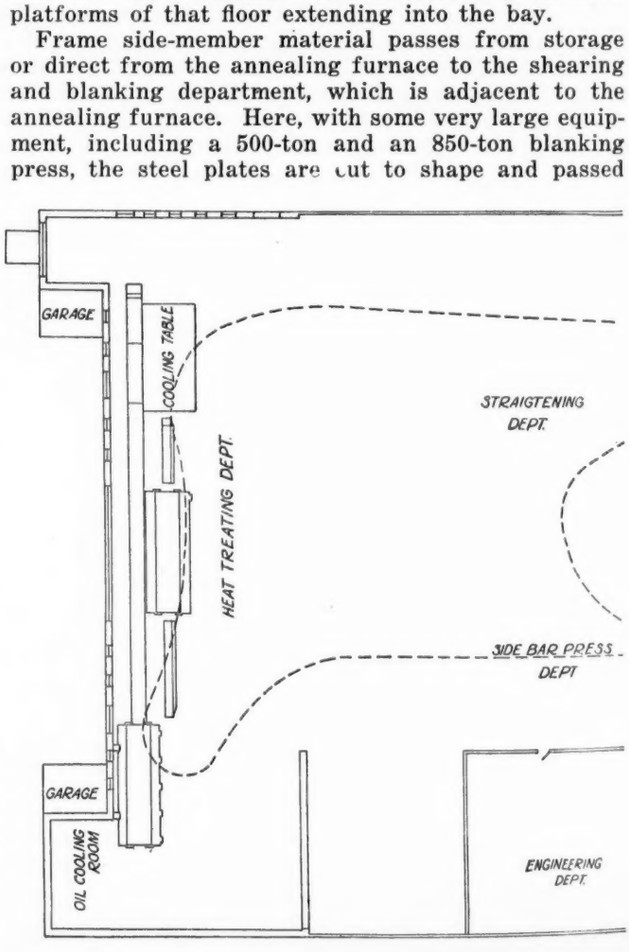
At each side, as shown in the accompanying layout diagram, a railroad siding extends about 200 ft. into the building. The lower siding is used for receiving raw materials and for the shipment of scrap which is returned in the same cars which bring steel to the plant. This receiving bay is served by two Niles 10-ton overhead cranes which can travel the entire length of the shop.

Steel is quickly unloaded from the cars by these cranes and stored at the front of the shop, under cover, until it is required for use. A considerable portion of the steel received must be annealed before it is used and at the end of the railroad siding is a 40-ft., oil-fired annealing furnace served by two trucks, one at either end.

The cranes load one of these trucks either direct from the incoming cars or from storage with as much as 100 tons of steel and it is then run into the furnace and firing commenced. While one load is being annealed, which usually requires from four to five days, the other truck, operating at the opposite end of the furnace, can be loaded and be ready to run into the furnace as soon as the first load is removed. In this way the furnace can be kept in constant operation with no delays for loading and unloading.

Steel designed for use in frame cross-members and other small parts moves directly across the plant from storage to small blanking and forming dies located near the center of the building while parts to be machined on the mezzanine floor are lifted by crane to platforms of that floor extending into the bay.

Frame side-member material passes from storage or direct from the annealing furnace to the shearing and blanking department, which is adjacent to the annealing furnace. Here, with some very large equipment, including a 500-ton and an 850-ton blanking press, the steel plates are cut to shape and passed



on a few feet to the forming dies, of which there are three: a 1000-ton, 18 ft. press; a 3300-ton, 25½ ft. press and a 4000-ton 30 ft. press which is one of the largest forming presses in existence.

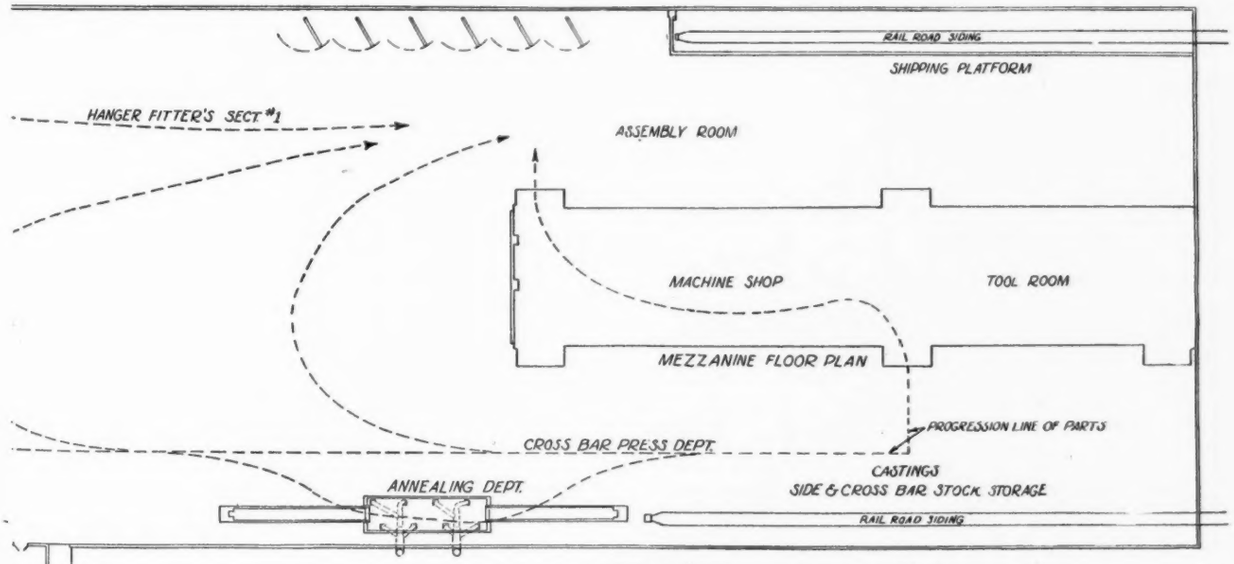
In all the material movements up to this point the sheets of steel have been handled in large bundles by means of slings. And the fact that such huge quantities of material can be transported at one time by the 10-ton cranes makes it possible for the two cranes to meet all requirements without delay.

General view of finishing departments. The load on the crane shows the method of transporting formed frames. Straightening machines are shown to the right

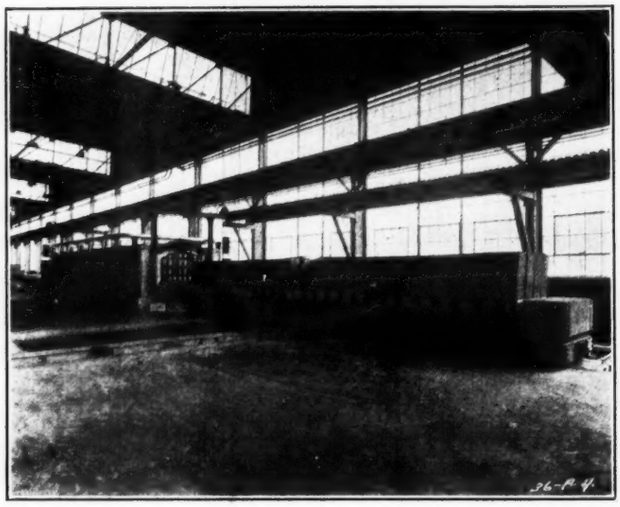
In looking for a method of handling the formed side-members in quantities but in such a way that they would be subjected to a minimum amount of stress and distortion, the Parish management gave the Youngstown Pressed Steel Co. a brand new use for one of their products. Youngstown sheet metal skids for use with lift trucks are well known throughout the industry. The Parish management looked at them and then asked why they couldn't be turned upside down, crane hook eyes placed at the four corners of the side flanges and the skid thus transformed into a sort of a tray to hold a number of side-members.

No sooner said than done, so now one of these erstwhile skids is placed, by a crane, alongside the forming dies, the formed members are placed into them as they come from the press and when they are filled with from 20 to 60 side-members the crane picks the load up and transfers it to the next station with absolutely no stresses being placed upon the individual pieces.

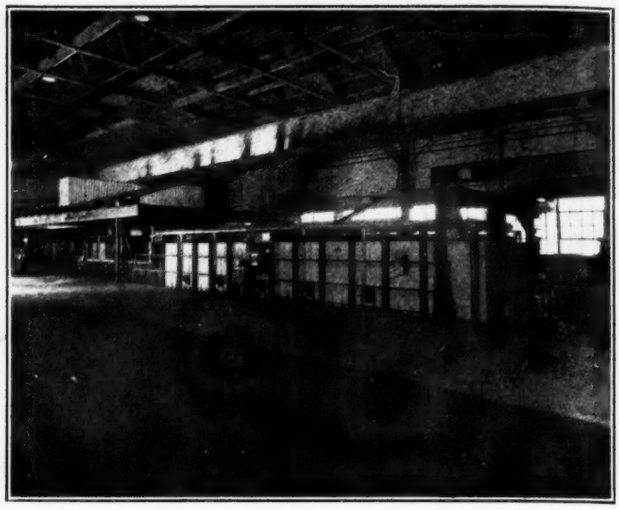
The next operation on side-members is heat treatment, which practically all pieces pass through. The hardening furnace is the same length as the annealing furnace—40 ft.—can also be loaded from either end and is located along the rear wall of the plant. The skid-containers, full of side-members, are placed on the floor alongside the furnace and the pieces inserted in the furnace by hand. At either end of the furnace are oil quenching tanks served from the fur-



Floor layout of Parish plant. Arrows indicate straight line movement of various parts from receiving department to assembly



The 40-ft. annealing furnace with a truck load of steel waiting to be inserted. The second truck is shown at the left

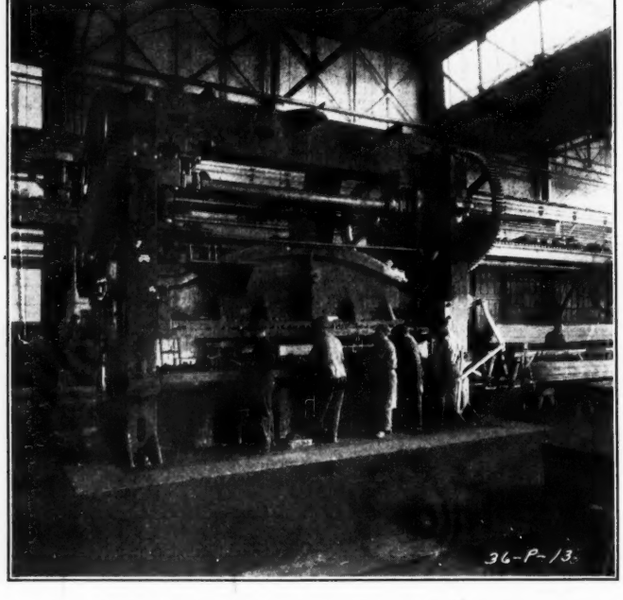


The 40-ft. heat-treating furnace with one of the Brinell testing machines in the foreground and the quenching furnace at the left

nace by roller conveyors leading to a hanger for single side-members which is suspended from an air hoist so that the piece can be raised and lowered in the oil bath until proper quenching is obtained.

Directly back of the oil bath is a 40 ft. truck running on a two-rail track and quenched side-members are slid across the quenching table onto this truck. When full it is hauled by an electric motor into a 40 ft. drawing furnace, and, after drawing, is again hauled across the rear of the plant to the cooling table.

Since each end of the hardening furnace is equipped with an oil bath the furnace can be kept in constant operation just as the annealing furnace can. The much shorter time required for drawing, however, makes it unnecessary to use both ends of the quenching furnace in order to keep up production. From the cooling table every piece which has been heat-treated is tested for hardness on a Brinell machine.



One of the huge forming presses employed in frame-making. A stack of blanked sheets is shown on the right

Side-members are tested in at least two spots as a check against the results of the heat-treating operation.

Adjacent to the cooling table is the sandblasting room where those parts requiring this operation are conveyed. Sandblasting is performed in inclosed booths with the operator outside and observing the operation through closely screened openings.

Transportation in this bay is of a somewhat different nature than in the first bay since the individual loads are smaller and the number of loads to be carried much greater than was the case when raw material was the principal material moved. For this reason this bay is served by three overhead cranes: one of 5-ton and two of 3-ton capacity, all of Shepard make.

In the process of heat-treating it has, so far, proved to be impossible to eliminate a considerable amount of warping so that the next department, where frame pieces are straightened, is a most important part of the productive processes. In this department hand work is necessary to a large extent although there have been developed a number of special machines which greatly facilitate the straightening process.

Fitted with Spring Hangers

After straightening, the side-members are fitted with spring hangers which have been machined on the mezzanine floor and have been taken, by cranes, from the outgoing platform on the machine floor and dropped at the proper point on the main floor. The side members are still being transported in the upturned steel skids and continue in this way until they are assembled with cross members.

Along the wall adjacent to the hanger-fitting department are six Cleveland radial drills with which the side members are drilled. Drilling templates extending the entire length of the frame are employed and they are located by pine entering into the spring-hanger holes. From this operation the side-members pass to the assembly tables where cross members and all the other parts are fitted into place.

Passing through the assembly department, the assembled frames next arrive at the painting department where they all receive a single spray coat of gray primer for protection against moisture, and

(*Continued on page 941*)

Krupp and Junkers Both Building New Diesel Engines

Developments are of light, high-speed type suitable for use on heavy motor vehicles. Changes made in Cummins fuel injection system. Other recent improvements noted.

By P. M. Heldt

DEVELOPMENT work on light, high-speed Diesel engines for the heavier classes of automotive work is being carried forward with considerable energy, especially abroad, where the higher prices of volatile liquid fuel make the immediate outlook for this type of engine seem brighter than here.

Two additional automotive type Diesel engines were exhibited for the first time at the Leipzic Spring Fair some time ago, one by the Friedrich Krupp Co. of Essen and the other by the Junkers Motor Manufacturing Co. of Dessau. The Krupp engine is shown in Fig. 1. It is built in two types, a four-cylinder and a six-cylinder, the former developing 45-65 hp. and the latter 70-100 hp., both at 700-1000 r.p.m. The engines are designed chiefly for use on cranes, dredges, railcars, motor boats and trucks.

The engine operates on the four-stroke cycle, with jet atomization by means of an open nozzle. An accurately measured quantity of fuel oil is forced to the nozzle by the fuel pump, which latter is located centrally in the cylinder head. It is sprayed through the fine orifices of the nozzle under high pressure directly into the combustion chamber of the engine and finely atomized. Only gas oil, paraffin oil and lignite tar oil are considered as fuel.

The engine is started electrically. The cylinder block and crankcase form a single casting of aluminum alloy, and cast-iron cylinder liners are set into this casting. The crankshaft is made of Krupp alloy steel and its bearings are finished by grinding. In order to keep down the over-all length the four cylinder crankshaft is mounted in three bearings and the six-cylinder in four.

Aluminum Alloy Crank Train

The pistons and connecting rods are made of aluminum alloy of high tensile strength. Unusually good combustion is said to be assured by the use of a special form of piston head on which patent protection has been secured. The cylinder heads for two adjacent cylinders are a single casting of iron. These cylinder heads contain the inlet and exhaust valves and the injector nozzle. The valves are operated from the camshaft through side rods.

The fuel pump is developed as a block pump and is combined with a governor and a fuel strainer. It can be readily removed from the engine. Lubrication is by the force feed system. Cooling is by a centrifugal pump which is driven directly from the crankshaft. Boot engines are fitted with two pumps, of which one is a bilge pump.

The Junkers engine is a two-cylinder double piston engine and is rated at 40-48 hp. at 1000-1200 r.p.m. Using only two cylinders reduces the number of pumps and injector nozzles required by one-half, and good balance is said to be assured by the double piston principle. A test made of this engine by Prof. Nagel of Dresden showed it to develop 1 hp. hr. on 0.38 lb. of fuel, which is a remarkably low consumption.

The Cummins engine, manufactured by the Cummins Engine Co., Columbus, Ind., is a development of the Hvid engine which this company at one time manufactured under license. But instead of a mixture of fuel and gases of combustion being forced into the combustion chamber by a partial pre-combustion in an ignition chamber, a mixture of fuel and air is forced into the combustion chamber mechanically.

Sectional views of the atomizer—which is the distinguishing feature of this engine—are shown in Figs. 2 and 3. During the inlet stroke, fuel enters the spray nozzle or atomizer, being delivered to it by a pump and admitted through a mechanically actuated needle valve

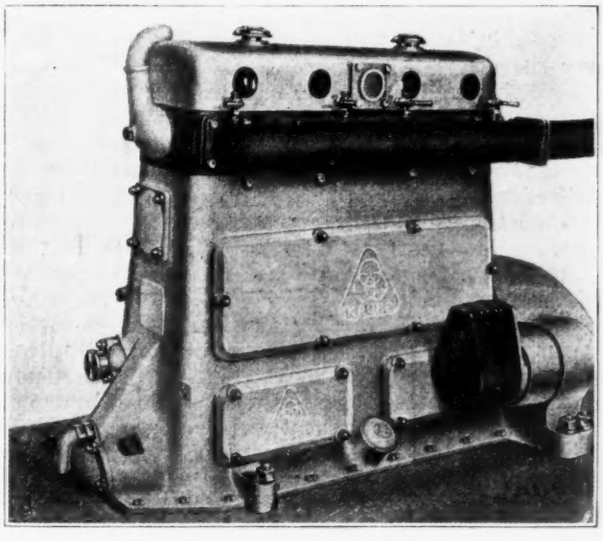
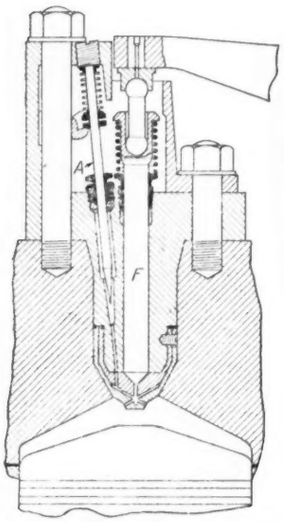
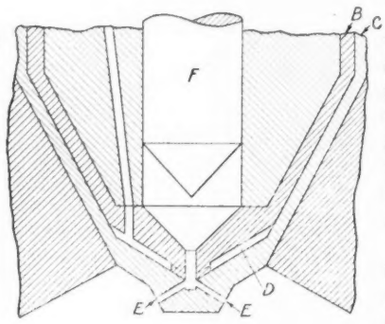


Fig 1. Krupp Diesel-type 65 hp. truck engine

A. By lifting the needle valve more or less, the amount of fuel admitted can be regulated. At the bottom of the injector valve there are two concentric cups, *B*, *C*, and an annular space *D* is formed between them. This annular space communicates with the seat of the needle valve *A*, with the combustion chamber through a number of spray orifices *EE*, and with the injector cylinder, which latter contains a plunger *F* with a conical end.





Above—Fig. 3. Enlarged detail of Cummins spray nozzle

Left—Fig. 2. Section of Cummins spray nozzle

During the inlet stroke fuel passing the needle valve accumulates in the annular space and in the lower part of the injector cylinder. It does not run out of the spray openings, because the plunger in the injector cylinder is drawn upward at the same time, creating a vacuum below it which causes the fuel to enter the injection cylinder.

During the compression stroke air is forced through the spray orifices *EE* into the injection cylinder, thereby finely atomizing the fuel, which has been heated previously by contact with the metal of the injector nose. At exactly the proper moment a properly shaped cam depresses the injector plunger and forces the mixture of air and atomized fuel through the spray orifices into the combustion chamber, where it is ignited by the heat of compression, and the expansion stroke then begins.

The cam is given such a form as to deliver the fuel at substantially the rate required to maintain a constant pressure throughout the period of injection, without material increase over the compression pressure.

With this engine the fuel measuring operation is extended over a considerable period of time and the fuel is forced past the metering needle valve at a low pressure. This is claimed to give unusually good control and to make it possible to throttle the engine down to a very low speed.

Fig. 4 is a diagrammatic sectional view of the fuel injection system of the Beardmore heavy oil engine developed by A. E. L. Chorlton. One feature of this system is the use of a flash valve which permits the fuel to return to the storage system during the first part of the delivery stroke of the pump plunger and then suddenly cuts off the return passage, causing the fuel to be injected into the engine cylinder. Another feature is that one pump supplies oil to two cylinders through the use of a distributor valve.

Referring to the illustration, at the left is seen a gear pump *A* by which oil from the supply tank is put under pressure. On the delivery line from the gear pump there is a pressure chamber or pressure dome *C* which is partly filled with air and which permits oil moved by the injector pump to flow back through the flash valve *D* when the latter is open, without creating excessive pressures. There is one pump for each pair of engine cylinders, and each pump has its own flash valve, the various pumps and flash valves being located in a block *B*.

It will be noted that both the pump barrels and the valve barrels are inserted parts and therefore interchangeable. The pump plunger *E* is reciprocated by means of the eccentric *F* from a shaft rotating at crankshaft speed, so that the injection pump has one delivery stroke for each revolution of the crankshaft. The flash valve *D* is operated from the pump plunger through the double armed lever *G*, and the timing of the flash valve can be adjusted by means of the eccentric *H*.

During the latter part of the pump suction stroke the flash valve is open and the pump chamber fills with oil. During the first part of the return stroke of the pump plunger the flash valve remains open and the oil displaced then flows back through the flash valve. Then the flash valve closes, and the pressure on the oil in the pump chamber suddenly rises to a point sufficient to open the nozzle valve *J*, the distributor valve *I* having established communication with this nozzle by this time.

It will be noticed that the lower edge of the enlarged portion of the flash valve, which is the edge determining the beginning of injection, makes an angle with a plane perpendicular to the axis of the valve. The latter at its upper end carries a small spur pinion with which meshes a toothed rack *K*, and by moving this rack in the direction of its length, the flash valve can be rocked around its axis and the moment at which injection begins thereby varied relative to the cycle of the engine.

A number of improvements have been made recently in the Beardmore engine which is manufactured particularly for railcar use in six and eight-cylinder types. Each cylinder is of 8¼ in. bore by 12 in. stroke and develops 50 hp. at 750 r.p.m. The weight of the six-cylinder 300 hp. engine is about 13 lb. p. b. hp. A vibration damper is now fitted to the forward end of the crankshaft, it being understood that the earlier engines were rather rough at certain speeds.

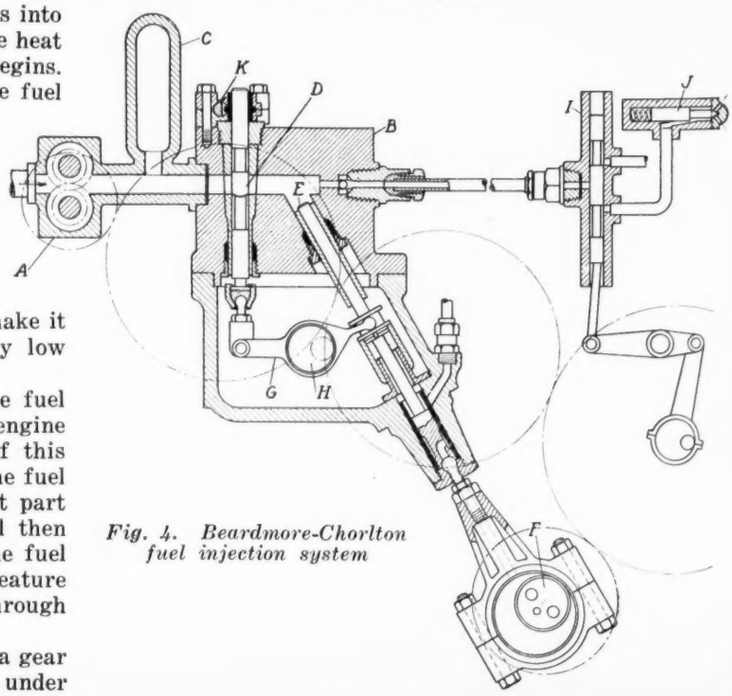


Fig. 4. Beardmore-Chorlton fuel injection system

The pistons are now of composite type, with forged Y-alloy heads and cast skirts of a copper-aluminum alloy, the two parts being bolted together. Each piston (Fig. 5), carries four compression rings and one oil-scraper ring. The piston pins float in both the pistons and the connecting rod boss and are provided with soft-metal plugs or buttons to prevent them from coming in contact with the cylinder walls.

Fig. 6 shows the Benz four-cylinder Diesel truck engine, which seems to have been the first Diesel engine ever built for this kind of work. Its manufacture, however, has been discontinued. The Mercedes-Benz Co. showed another design at the recent Cologne commercial vehicle show, a six-cylinder type, with aluminum cylinder block and crankcase and inserted cast-iron liners.

Referring to tests made by Otto Kehrer of the Munich Heat Engine Laboratory, Wa. Ostwald in a recent issue of *Auto-Technik* points out that combustion is much less efficient in Diesel and hot bulb engines than in carburetor type engines. Kehrer's investigations have

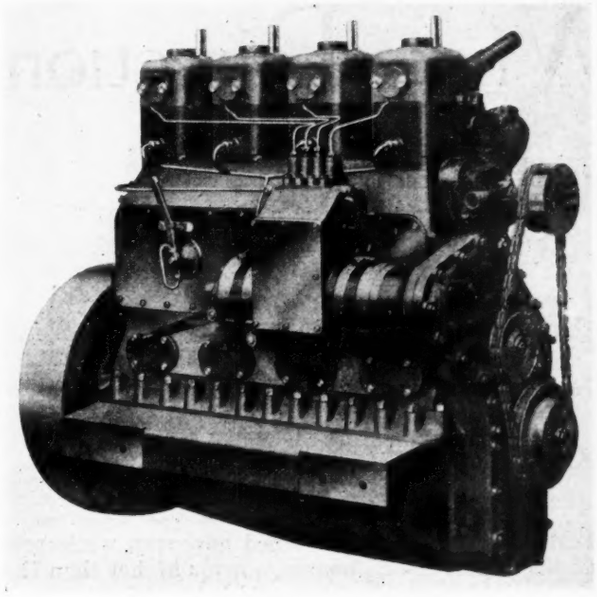


Fig. 6. Benz Diesel-type four-cylinder truck engine

shown that not only do the first two engine types work with a very large excess of air, but that they fail by far to completely burn the fuel injected into them. Carburetor engines, on the other hand, give an almost complete combustion with a mixture of the theoretical proportion or slightly lean.

The reason for the high combustion efficiency of the carburetor type engine is that it works with a well-prepared mixture, wherein at the beginning of the combustion period fuel and oxygen particles are everywhere so close together that no displacement of matter is necessary to effect the combustion. In the Diesel and hot bulb engines both a displacement of matter and the chemical reaction must take place during the extremely short combustion period, and since the chemical reaction is dependent on the displacement of matter, it is no wonder that the reaction suffers at first.

It follows from the above that the Diesel engine is as yet a comparatively crude, imperfect machine. If it should become possible to burn the fuel in such engines substantially completely without a large excess of air, the output per unit of displacement would be greatly

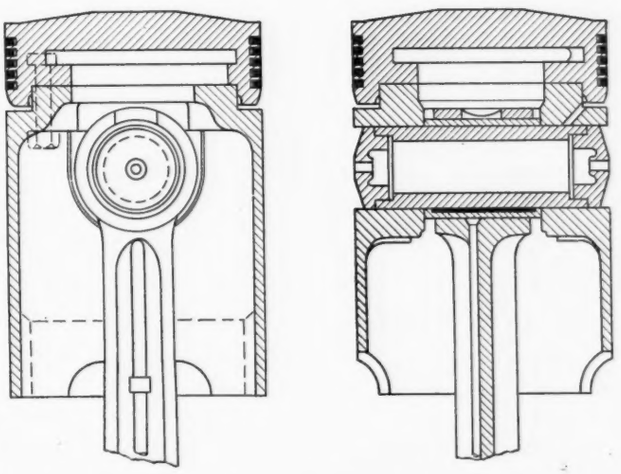


Fig. 5. Composite piston of new Beardmore engine

increased and the engine also would have a much higher fuel economy, even though it is today the most efficient converter of heat energy into mechanical work. Much still remains to be done in this direction. Evidently, the higher the engine speed the more difficult it is to effect anywhere near complete combustion with only a slight excess of air.

Material-Handling Minimized

(Continued from page 938)

alongside the paint department is the shipping platform from which the completed frames are loaded directly into cars for outgoing shipments.

In the entire process of making the completed frames there is no single instance where any of the component parts retrace their steps. Each operation is located in the proper sequence in the factory layout so that as a piece passes through one process the next process is directly adjacent. Although there is no sign of crowding of equipment, as indeed it would be almost impossible to do considering the size of the pieces being processed, the machines have been so arranged that there appears to be what is almost an absolute minimum of necessary movement of materials between the various operations.

This is well illustrated by comparing the paths of side-members and spring-hangers, for example: The former require heat-treating, straightening, and many other operations unnecessary for the smaller pieces, so that their path continues all around the building. Spring-hangers, however, require only machining and this is done, not down in one end of the shop or in an adjacent shed, but on a mezzanine floor which is directly between the spring-hanger storage space and the point on the assembly floor where they are fitted to the side-members.

This economy of material movement is again illustrated by the very few material-handling devices used. Although there are a number of small hoists and similar items of equipment used for lifting material about the plant the entire job of moving the product from receiving to shipping is carried out by seven traveling cranes. That this work can be handled efficiently without interfering with production with such scanty equipment speaks volumes for the plant layout.

Car Prices—in What Direction Are They Headed?

Indications are that downward trend will continue during rest of 1927 but fair degree of stability may be expected. Ford and his new model are big factors in low-price field.

By Norman G. Shidle

WITH at least seven companies having announced price cuts on one or all models during the second quarter, the probable price trend for the rest of 1927 has come to occupy a major place in discussions among factory executives. The decreases registered quite recently by Oldsmobile and Willys-Knight have served to increase speculation about future price tendencies, following, as the did, on the heels of second quarter price reductions by such other companies as Diana, Lincoln, Pierce-Arrow, Stearns and Studebaker.

These second quarter declines for the most part were in line with price activity started during the first quarter which opened with a number of reductions in and around show time in January. This first flock of cuts, few of them of such size or importance as to affect materially the immediate sales trend of the industry, were participated in by Chevrolet, Franklin, Jordan, Locomobile, Overland, Paige, Star and others. Chrysler, Davis and Stutz also lowered their lists on one model about that time.

Then along came the Packard slash in March, with Flint also making a revision during the same month. The declines recorded after the Packard cut and during the second quarter have been mentioned.

Price increases during the first six months haven't been very numerous. Back in January, Kissel, McFarlane and Chandler recorded advances, while prices on the new Hudson lines were made higher than those on the old models. Since that time, however, the increases for the most part have been isolated advances on one or two models, usually on open cars, by a few companies. Dodge, for instance, lifted the price on its sport roadster by $30 in March, Elcar raised one touring model $200 last month, and Studebaker, with reductions on several models in May, lifted one phaeton price by $15. Velie raised prices on three models in March and Stearns made a general increase June 6. Announcing its new "62" line this week, Chrysler makes a $20 increase on a touring car of that model, although other prices in the line remain the same.

Trend Has Been Downward

Clearly, though, the general price trend has been downward during the first half of this year and there is little evidence to point toward any reversal in that trend during the coming six months. A few executives profess to look for a great price scramble with competitive cutting all along the line in the early fall or thereabouts. This group, a small one so far as can be determined, takes something of an after-the-deluge attitude toward competitive conditions in the near future.

The far more general belief, on the other hand, is that a reasonable degree of price stabilization is to be expected during the next six months. The price policies of General Motors Corp., which cannot help but affect materially those of the whole industry, have been of a definitely stabilizing character for several years and it is reasonable to assume that they will continue along similar lines in the future. Some of the recent readjustment in General Motors prices possibly have been caused as much by a desire to better align various models within its own organization as by competitive conditions as related to the industry at large. This same element may be responsible in part at least for some future readjustments.

"Watchful Waiting" Attitude

There is no dodging the fact, nevertheless, that possible price changes are very much in the foreground of executives' minds. But the attitude in most cases seems to be one of watchful waiting and preparation to take action, should action appear to be necessary, rather than one of active desire or determination to cut prices on general principles. The strenuous drive for greater profits per unit which has been launched by many organizations this year is another factor operating to oppose further price reductions if they can be avoided.

Wages have been reduced to some extent, it is true, but scarcely enough to make a saving of very many dollars per car in most cases. A factor of greater importance from a cost standpoint, of course, is the lower general level of raw material prices, especially of those consumed by the automotive manufacturers. *Automotive Industries* raw material index has hovered around 125 ever since February of this year, while during the period covering February to June of 1926 it ranged between 138 and 133. This index has shown a steady decline ever since the first of the year, December having been the last high point, when the index stood at 136.

The constant pressure on parts makers which has resulted in lower parts prices, generally speaking, might be considered another element favorable to further reduction of car prices during the next two quarters.

Despite this combination of conditions apparently making possible price declines, an examination of the profit and loss statements of car companies thus far this year gives no indication that further reductions could be made with a continuance of entirely satisfactory profits.

A few companies, to be sure, have been making substantial gains over 1926 both in profits and production, but their advances are not typical of the industry for the first half of 1927. General Motors with its $52,257,609 profit for the first quarter exceeded its first quarter earnings of 1926 by $17,402,793. Chrysler recorded a gain over its 1926 first quarter of $965,942 or 23.5 per cent. Hudson made $4,026,515 net profit in the first three months of this year as against only $2,746,023 during the same period last year, a clear gain of just over 50 per cent. And one or two other companies have been able to show favorable results as well.

On the whole, however, many stable, sound companies have been unable to come up to their 1926 levels this year so far as profits are concerned. Reductions in net earnings for the first quarter of 1927, as compared with the first quarter of 1926, ranging all the way from 30 to 90 per cent have been recorded by important car manufacturers. This does not appear to be a favorable background for any general orgy of price cutting.

One other strong factor appears to oppose a great flurry of price competition, even though the general trend may continue to be slightly downward. The old idea that price cuts alone are an extremely potent merchandising weapon is being dissipated. Ford's final failure to make the grade by relying almost entirely on this means of meeting competition probably did more than any other single thing to disseminate education on this subject. Now Hudson and Essex, with a new line of cars, has carried on to new successes this year although the price levels of its products are slightly higher than they were a year ago.

In the view of a number of economic experts, moreover, commodity prices in general have reached the bottom and stabilization or an upward trend is the next move to be expected.

In this connection it will be interesting to watch the progress of the new Ford model which is scheduled for next month. Rumor says that this new car will be slightly higher rather than lower in price. It will rely on qualities and sales appeals other than price alone for its success in its competitive price class. And there is no blinking the merchandising force and power of a new Ford brought in line with modern merchandising and engineering trends and backed by the marvelously widespread and efficient Ford organization. Particularly is this true when it is realized that the new Ford seems likely to be sold in accordance with the various appeals which have been influencing the public favorably as regards other lines of merchandise and that this direct selling effort apparently is going to be backed by a constructive advertising campaign.

Effect Can't be Determined

Just what the effect of the new Ford will be on the price structure in the under $600 price class cannot yet be determined. That it will be an important factor—perhaps *the* important factor—in shaping price policies in that competitive group seems almost certain.

In the industry at large the present outlook as regards prices seems to boil down to a probability of reasonable stability throughout the rest of the year with indications pointing toward a continuance of the downward trend which has been in evidence during the last six months.

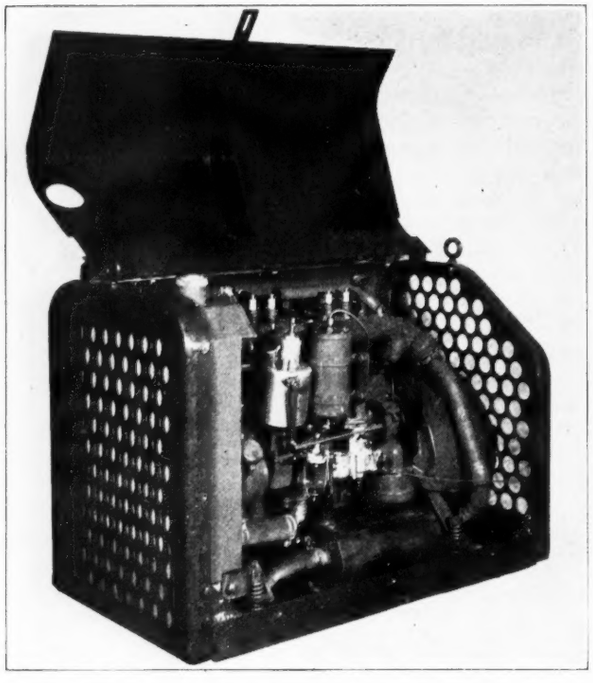
A Correction

DUE to typographical errors, J. H. Hunt, president of the Society of Automotive Engineers, in his article on "What Engineers Should Read," in the June 4 issue of *Automotive Industries*, is made to say in the course of his discussion of Will Durant's "Story of Philosophy" that, "Durant does not claim to understand philosophy, and has no intention of trying to do so, but his book seems thoroughly worth while, etc." In Mr. Hunt's manuscript this sentence read, "The writer" (Mr. Hunt) "does not claim to understand philosophy, and has no intention of trying to do so, but Durant's book seems thoroughly worth while, etc." The errors were of such a nature as to completely reverse the author's meaning and this correction is made in justice to both Mr. Hunt and Mr. Durant.

NEW DEVELOPMENTS—Automotive

Ready Power Unit

THE Ready Power Co., Detroit, manufacturers of gas-electric power units for industrial trucks, has announced a new unit. It consists of a Continental H-9 motor driving an electric generator, the armature of



New Ready Power industrial truck unit showing inclosing case and spring suspension

which is bolted directly to the crankshaft flange replacing the flywheel.

The assembly is enclosed in a steel housing and is suspended from the main frame by four springs. Equipment includes oil filter, air cleaner, gasoline strainer and vacuum fuel system. Water cooling is employed. Magneto ignition is used in connection with an impulse starter.

The new unit is cranked from the side. It has been designed to furnish maximum accesibility for adjustment and repairs. Units are available for nearly any standard make of industrial truck.

Hose Clamp Easy to Install

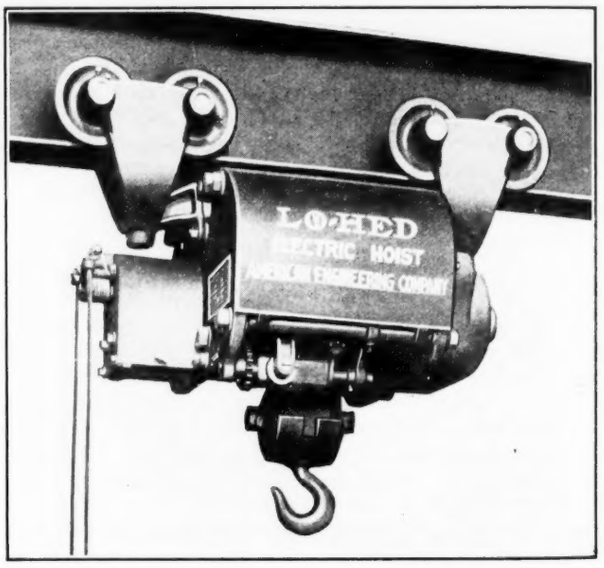
A NEW hose clamp which can be installed very quickly is a new product of the National Clamp Co., New York. This new clamp consists of a band upon which is embossed a series of transverse ridges and depressions forming, in effect, a toothed rack. The screw engaging with this toothed band is mounted on a trunnion. When the band is slipped over the hose and compressed with the hand the screw is turned with a screw-driver and, working as a worm drive, tightens the clamp to any desired degree in a very short time.

Electric Monorail Hoist

A MOTOR trolley electric monorail hoist that operates in 15½ in. headroom is a recent development of the American Engineering Co., Philadelphia. The hoist is built in ½ and 1-ton sizes and is similar in construction to standard Class A Lo-Hed hoists except that it is mounted on an 8-wheel trolley, which reduces headroom requirements by 5 in.

It operates at 20 ft. per min. on a-c. current or at 20-40 ft. per min. on d-c. current while a special high speed hoist provides speeds just double those of the standard jobs. Remote control for both hoist and trolley can be provided.

The hoist travels around short radius curves, shifts easily over switches and is protected from dust and



New Lo-Hed 8-wheel trolley electric hoist

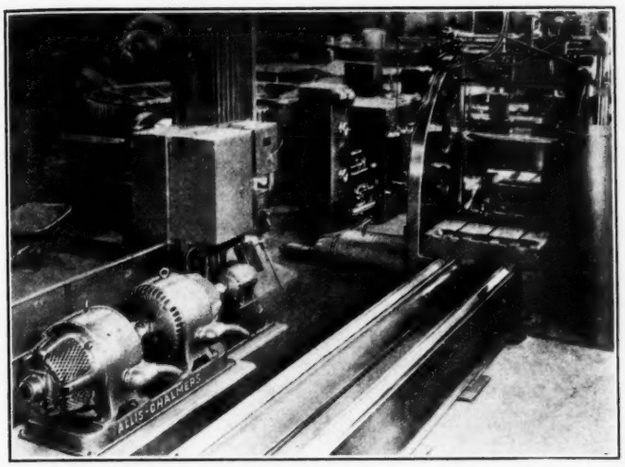
moisture by metal covers. Motors are fully inclosed. Hyatt bearings are employed on the gear shafts and in the trolley wheels. A ball bearing motor designed for hoist use drives the drum through spur gears which run in oil. Alemite lubrication is provided for all bearing not automatically lubricated by the oil bath. Holding and lowering brakes give full control of the hoist at all times and, combined with a positive acting upper limit switch, insure safe operation.

AUTOMOBILES STUDEBAKER is the title of a new firm organized in France for the sale of Studebaker cars. It has a registered capital of 500,000 francs and has headquarters in Levallois-Perret, a suburb of Paris.

Parts, Accessories and Production Tools

Allis-Chalmers Planer Drive

ALLIS-CHALMERS MFG. CO. has recently developed a new planer drive which provides large range of speeds—10 to 85 ft. per min. cutting speed with full torque available and 180 ft. per min. return speed. It



Allis-Chalmers high speed planer drive

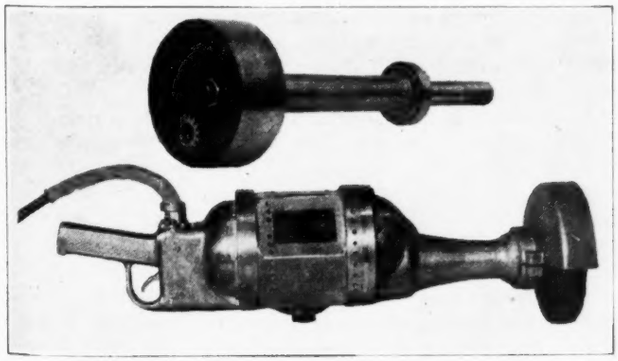
is completely automatic with a new type of control and is designed to give complete safety for the operator, the work and the machine. The planer motor has oversize rotating parts, dynamically balanced. The motor generator set which drives the planer motor has reserve power.

With a return speed of 180 ft. per min., 6 ft. stroke, 20 ft. per min. cutting speed, a steel bar 1½ in. diameter and 9½ in. long on the planer table is said not to tip over at either end of the stroke.

Portable Electric Grinder

A NEW portable electric grinder powered with a universal motor and with an internal gear drive, has recently been developed by Black & Decker, Towson, Md. The internal gear is of sturdy construction and the wheel spindle is supported at each end by tapered roller bearings in order to withstand the constant side thrust to which a grinder spindle is subjected.

Another new feature is the location of air intake holes so that there is less likelihood of sharp particles of grit from the grinding operation being drawn into the motor.

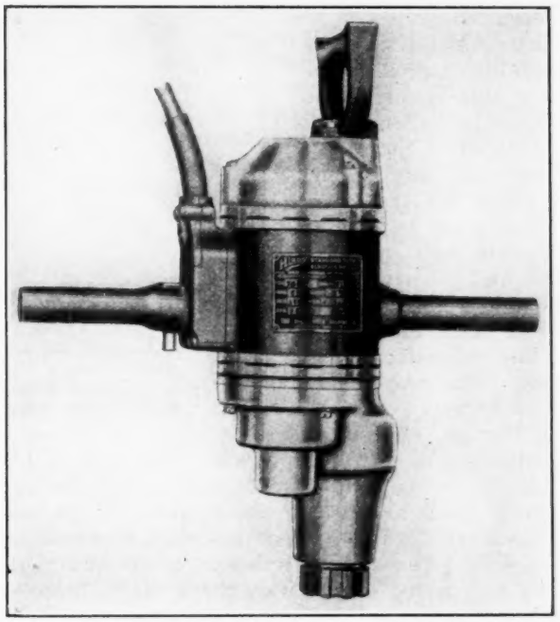


New Black & Decker portable grinder with detail of internal gear and wheel spindle assembly

Hisey-Wolf Universal Drill

A NEW ⅞ in. universal drill is a recent product of The Hisey-Wolf Machine Co., Cincinnati. The motor is mounted in ball bearings. The gear on the armature shaft is removable and the compound gear shaft is supported in bearings at each end. The drill spindle is fitted with a Morse No. 2 taper socket, is hardened and ground and lubricated through the gear-case.

Brush holders with adjustable spring tension are mounted as a separate unit on a Bakelite yoke to permit brush adjustment. The end handle cover is a rugged casting designed to carry all pressure and to relieve the motor and bearings of strain. New weight of the drill is 25 lb.



Hisey-Wolf ⅞ in. universal drill

An Acknowledgment

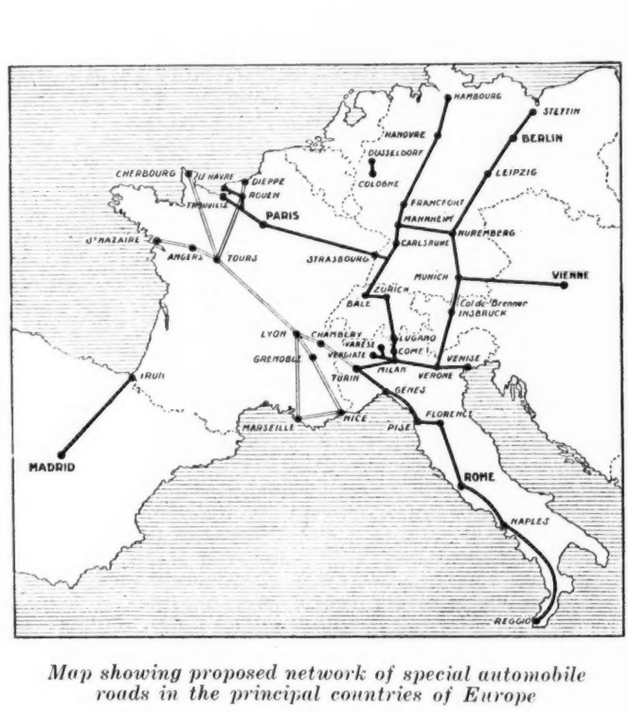
IN the article by Edmund E. Neil, titled "Engineering Problems in Truck and Bus Design to Meet Weight Restrictions," page 850, June 4, 1927, photograph K shows two views of a frame before redesign, while L illustrates the same frame after improvements were made. These two photographs and the stress diagram on the same page were supplied with the assistance of F. A. Whitten, chief engineer, American Car & Foundry Motors Co., Detroit, and acknowledgement is hereby made of the courtesy.

Network of Special *Motor Roads* Projected *in* Europe

France, Italy, Germany, Spain and Switzerland all have ambitious programs under consideration. Would be toll roads constructed by private capital.

THE subject of roads specially built and reserved for automobile traffic is now strongly to the fore in Continental Europe and was discussed at the International Road Congress held some time ago in Milan, Italy.

There was a time when the subject was a live one in this country, and we have a reminder of that period in the Motor Parkway on Long Island; but since the traffic on our roads has become so overwhelmingly motor traffic and all new roads are built with a special view to their fitness for this kind of traffic, it has passed into the background here.



Map showing proposed network of special automobile roads in the principal countries of Europe

In Europe, of course, the situation is entirely different. The bulk of highway traffic is still horse traffic, and practically all of the main roads are still of the ordinary water-bound macadam type, which are poorly suited to motor traffic. Owing to exceptionally heavy traffic and neglect during the period of the war, these roads, moreover, are in a rather poor state of repair.

Opinion as to the utility of special roads is far from being unanimous; in fact, opposition to the various schemes is rather emphatic, but it is recalled in this connection that the usefulness of railroads was denied by some in their early stage, and M. Thiers, the French statesman, even denied their utility during the middle of the nineteenth century.

Writing in *Dimanche-Auto* of May 29, M. Jacques-Thomas, who was a French delegate to the International Road Congress, observes that if automobile traffic continues to grow as it has grown during the last twenty years, the present road system soon will be found insufficient to permit of the free circulation of the vehicles. It would seem, therefore, that one should contemplate simultaneously an adaptation of the existing roads to a more intense automobile circulation and the creation of new "high efficiency" roads specially for that class of traffic, which would permit of covering long distances at high speeds.

Whereas the adaptation of the existing roads is a matter for the Government to look after, the creation and exploitation of special roads should be left to private enterprise, in accordance with the plan under which railroads are operated in most countries. The construction of such roads calls for large capital, and moneys for the interest on this capital and its amortization must be raised by tolls exacted from the road users.

This question—which is as yet rather a question of the future than of the present—was dealt with in a paper presented to the French Society of Civil Engineers on May 13 last, by M. Kerm-Marsand, dealing with a proposed auto-road between Paris and Trouville, which is of his conception. This project is said to have met with a good deal of support already, and its execution is not improbable.

Italy was the first country to build true automobile roads, known as *autostrades*. These roads, which connect Milan with the Lagio Maggiore (Great Lake), with Como and Varese, have an aggregate length of about 50 miles; the width of the roads is 36 ft. in general, but the trunk road from Milan to Gallerate is 46 ft. wide. The pavement is of concrete which is surfaced with a bituminous covering. Traffic in the two directions is limited merely by a central white strip. Motorcycles are not admitted to the *autostrades*, which are reserved to vehicles having at least three wheels and elastic tires. These vehicles are divided into three

classes, according to horsepower, and tolls are levied at the entrance for the Autostrade Co., which built and operates the toll roads.

In consequence of the success achieved by this first undertaking, and in view of the fact that the public roads in Italy are very poor, an extension of the system in successive steps is contemplated, the main arteries being Turin-Milan, Verona-Venice, Turin-Genoa, Pisa-Florence and Rome-Naples, with a subsequent extension to Reggio.

Germany has possessed a special automobile road since 1921, the Avusbahn, between Berlin and Charlottenburg. But in view of its short length (12½ miles in a closed circuit), this road is of only local interest. It is a tar-macadam road and requires considerable maintenance expense, except for a length of 800 ft. which has a concrete pavement. The Avus Company, which exploits this road or track, levies the following tolls:

One-way trip 1.20 marks; round trip 2 marks; weekly subscription 9 marks; monthly subscription 32 marks; annual subscription 320 marks.

At the present time, however, Germany has under consideration some pretentious schemes of main automobile traffic arteries (*Schnellstrassen*, i. e., speed roads). Powerful organizations are being constituted for the construction of these roads which will connect the chief centers of population, although they will by-pass these centers, and will make connections with similar roads projected in adjoining countries, with a view to creating an international network of special automobile roads. The two principal trunk roads would be:

1. Hamburg, Hannover, Frankfort, Mannheim, Carlsruhe, Basel. This road would pass close to Strasbourg, on the right bank of the Rhine.

2. Stettin, Berlin, Leipzig, Nuremberg, Munich, with extension to Innsbruck by way of the Brenner Pass, and to Vienna. These two North and South routes would be connected by a transverse route from Nuremberg to Mannheim.

Finally, the two industrial cities of Dusseldorf and Cologne are to be connected by a special automobile road which is already partly completed.

Switzerland is studying the project of a route Basel-Zurich-Lugano (155 miles), which would connect the German with the Italian network and thus make a direct through road from Hamburg to Milan.

As to Spain, it has under way a project for a road from Madrid to Irun, thus connecting the capital to the seaside resort San Sebastian and to France.

So far the subject of special roads has not rereceived any very serious consideration in France. Nevertheless, the importance of providing for foreign tourists landing in French ports, well-paved roads over which they could travel in comfort to the principal centers of the tourist industry, is fully appreciated. Thus the A. C. O. and M. Andre Michelin have worked out a project whereby tourists landing in Saint Nazaire, Cherbourg, Le Havre and Dieppe, would find fine main roads by which they could reach Tours and Lyons, whence they could pass on to Savoy, the Alps, the Mediterranean Coast and Italy. But what they had in mind was merely an adaptation of existing roads and not the construction of new ones.

M. Kerm-Marsan, on the other hand, is of the opinion that it is indispensable to build in France special automobile roads like those which have been projected in neighboring countries, and that the first one to be attempted should connect Paris with the sea coast. Later on this road should be extended from Paris to Strasbourg, where it would connect with the German network, and, in consequence, with the whole Central European system of auto roads. Extensions from Paris to the Mediterranean Coast and to Irun by way of Bordeaux could be left to a later date. The automobile road from Paris to the sea coast would end at Trouville and extend for its whole length along the left bank of the Seine. It would later be completed by a branch to Le Havre.

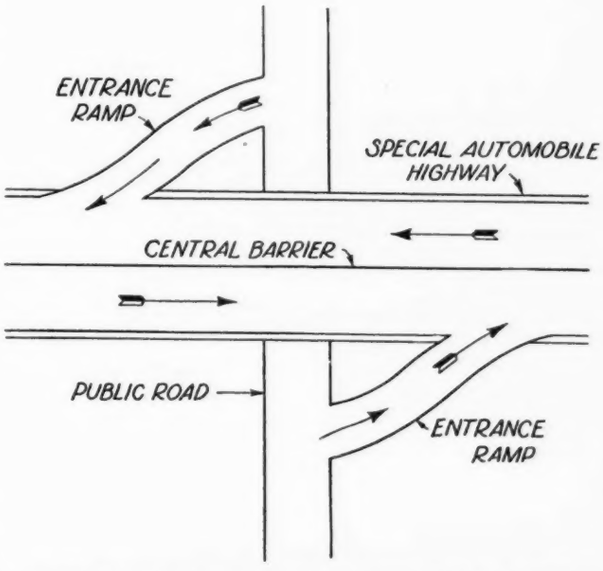
Following are the general lines of the Kerm-Marsand project for the automobile road Paris-Trouville, the first stage of which would be Paris-Saint-Germain:

The route will follow a straight line as nearly as possible, and no attempt will be made to reduce the grades. While on the Italian *autostrades* grades are limited to 3 per cent, in this case they may reach 7 and 8 per cent. On a straight course, on which there can be no unexpected interference, an automobile running at considerable speed, may ascend grades of almost any steepness without changing gears, provided the grade is not too long.

The total width of the road, at least at the Paris end, will be 70 ft. Vehicles proceeding in opposite directions will be kept apart not merely by a white central line, as on the Italian roads, but by a veritable barrier, preventing all interference between vehicles running in opposite directions. This barrier, moreover, may serve as a screen preventing annoyance of drivers by the glare of vehicles proceeding in the opposite direction. The project also provides for the eventual lighting of the route over its whole length.

There will be no level crossing (railroads) nor any road crossings. Connection with intersecting roads will be made by means of ramps, separate for the two directions of travel, as shown in the sketch herewith. As to the pavement to be used, this will vary with the district, and will consist of concrete, tar-macadam or asphalt.

The capital necessary for the construction of an automobile road from Paris to Trouville is estimated at 350,000,000 francs ($13,700,000 at the present rate of exchange), including indemnities for all property which might be condemned.



Sketch showing type of special automobile road that is planned in France

THE FORUM

Treves *Explains* Equation *for Power* Consumed *by* Supercharger

Author of paper which appeared in *Automotive Industries* Says that phenomena of flow of air through the supercharger must be taken into account.

Editor, AUTOMOTIVE INDUSTRIES:

I read with great interest in your issue of Jan. 29 the comments of William Samuels on my article on supercharging, which was printed in your Engineering Number (June 10, 1926). Mr. Samuels thinks the equation

$$L = 427\ c_v\ (T_c - T_o)$$

should be substituted for my equation

$$L = 427\ c_p\ (T_c - T_o)$$

for the power required for driving the supercharger. This, however, is not correct, as it does not take account of the phenomena of the flow of air through the supercharger; particularly that the supercharger must impart to the mass of gas passing through it a kinetic energy $x^2/2g$, where x is the velocity of the gases, which is transformed into pressure at the outlet from the supercharger.

In fact, for the solution of the problem it is necessary to add to the fundamental equation of thermodynamics

$$dQ = c_v\, dT + Ap\, dv. \quad . \quad . \quad (1$$

where dQ is an elementary quantity of heat absorbed by unit weight, and $c_v\, dT$ the elementary variation of internal energy, the equation

$$\frac{dx^2}{2g} + \frac{dp}{\gamma} = 0 \quad . \quad . \quad (2)$$

to represent the flow of a fluid element for which the effect of gravity is negligible. Here x represents the velocity of a particle of the fluid in motion; g the acceleration of gravity, and γ the weight of a unit volume.

$$\gamma = \frac{1}{v},$$

v being the specific volume.

We then have

$$\frac{dx^2}{2g} = -\,v\, dp \quad . \quad . \quad . \quad (2a)$$

From equation *(1)* we deduce

$$dQ = c_v\, dT + A\,[\,d\,(pv) - v\, dp]$$

Furthermore, since

$$d\,(pv) = d\,(RT) = R\,dT$$

and also taking into account equation *(2a)* we get

$$dQ = (c_v + AR)\, dT + A\,\frac{dx^2}{2g}$$

$$= c_p\, dT + A\,\frac{dx^2}{2g}$$

For adiabatic flow, for which Q is zero, we then have

$$c_p\, T + A\,\frac{x^2}{2g} = constant$$

Since T_o and T_c are the absolute temperatures of the atmosphere and at the supercharger outlet, it is evident that the energy which must be furnished by the supercharger for the compression of 1 kg. of gas is

$$L = \frac{x^2}{2g} = 427\ c_p\ (T_c - T_o) \quad . \quad . \quad (3)$$

This is the equation used in my article.

SCIPIONE R. TREVES,
D. Sc., Mech. Engr.

Effect of Front-Wheel Drive on Tire Wear

Editor, AUTOMOTIVE INDUSTRIES:

In view of the recent interest shown in front-wheel drives, it would be interesting to hear a discussion of the effect, if any, of front-wheel drive on tire wear. The tire makers have pointed out that excessive tire wear can be caused by too much toe-in on the front wheels, a scrubbing or abrading action being introduced due to the fact that the plane in which the wheel revolves is at an angle with the direction of motion of

the chassis. The tire makers in this instance were referring to the conventional chassis with rear-wheel drive.

From a casual observation, it would seem as if this abrading action would be aggravated by the front-wheel drive. In support of this idea, those familiar with four-wheel drives may have found them rather hard on front tires. The writer recalls the case of a number of four-wheel drive trucks purchased from the Government shortly after the war and put into road repair work. These trucks were equipped with solid tires. As a rough estimate, the life of the front tires was about one-half that of the rear. Whether this was due to excessive toe-in on these trucks, or whether all four-wheel drive or front-wheel drives show that same tendency, is a point upon which it would be very interesting to hear opinions and experiences. The instance given above was for close-coupled, heavily-loaded trucks, and naturally the conditions are not comparable with either pleasure cars or racing cars. However, it may be an indication of the effect to be looked for in the latter two cases.

PAUL WELLENKAMP.

Left Hand Steering

Editor, AUTOMOTIVE INDUSTRIES:

Referring to the claim that the late Harry F. Kreuger was the first to build a car with left hand steering, it is a matter of record that I built a car with left hand steering in 1899 and exhibited another with left hand steering at the 1901 show at the old Madison Square Garden. At the same show I also exhibited a six-ton truck with left hand steering.

I do not know just what brand of fame attaches to achievements of this magnitude, but submit the facts for what they are worth.

E. T. BIRDSALL.

Engineers' Salaries and Opportunities Discussed

A YOUNG man who contemplates entering design or research work in the automotive field naturally wishes to know something about salaries.

"Detailers are paid from $1,800 to $2,000 per year in the Detroit district, while layout men receive about twice as much. A layout man is really an experienced designer and frequently has much more to do with the details of the completed vehicle than the engineer who nominally is responsible for it."

Thus writes J. H. Hunt, president of the Society of Automotive Engineers, in a recent issue of the S.A.E. Journal. Continuing, he says:

"Beginners in the laboratory or in the experimental shop are paid about the same amount as detailers. The technical man of average ability usually progresses somewhat more rapidly in the laboratory than in the drafting room at first but may find himself handicapped later to some extent when competing for the position of division engineer with someone who has had experience in designing as well as drafting. Most of the chief engineers now in the industry have worked at the drawing board, and it seems likely that this general situation will continue.

"Salaries paid to research men who are part of the organization of a manufacturing company in which the engineering organization is expected primarily to produce designs are likely to be about the same as in other divisions, except when special reasons exist for assigning a certain man on a specific task.

Fascinating Type of Work

"Research laboratories which are not adjuncts of design producing organizations are too new to have established any basis of salaries. It has been necessary to pay approximately what the usual engineering departments would pay to secure the kind of men needed to get started. Individuals who are engaged in it have the fascination of working on most interesting problems.

"Division engineers in a large organization receive from $5,000 a year to possibly twice as much, depending on the organization and the men. Chief engineers, and in particular those who are also company officers, are not only paid salaries that may be several times that of their assistants but often have some special bonus arrangement that can make them financially independent in a few years.

"In these days of aggressive sales promotion there seems to be a tendency to take from engineering into sales work young men of good personality who have the ability to talk convincingly about the merits of a product and the basis of its development. In most cases this provides a fortunate opportunity for the man who is transferred.

"The question naturally arises whether as great a change in industry will occur in the next twenty years as in the last two decades. Every fact leads to the belief that the situation will not change greatly from the present unless some unexpected invention is brought forth or an unfortunate combination of circumstances greatly reduces our country's prosperity. Therefore a young man can enter the field of design and research with the expectation of plenty of work throughout his career. He cannot expect to have as many opportunities to enter a small company and have this carry him upward as have occurred in many cases in the past; he must also expect keener competition than the last generation met. We have every reason to believe that the prizes will be as great as in the past."

BY reason of the high horsepower tax imposed on automobiles in certain European states and the high horsepower ratings of even the smallest American cars, the practice of reducing the cylinder bore of these cars by the insertion of bushings has gained considerable vogue. Engines so converted, together with the bushings inserted and the aluminum pistons supplied to fit the bushings, were exhibited at the last Brussels show, and now the French Department of Mines has deigned to take notice of the practice by issuing special rules for determining the tax horsepower of engines so modified.

In the case of regular stock engines, the horsepower rating is determined when the type is first placed on the market and submitted for that purpose by the manufacturer to the Department of Mines, which has charge of automobile licensing in France. Any new owner then merely needs to present proof that his car is of the particular type, and it will be taxed in accordance with the rating of the type. However, in the case of bushed engines, the bore must be determined separately in each case.

AUTOMOTIVE NEWS SECTION INDUSTRIES
Philadelphia, Pennsylvania Saturday, June 18, 1927

Seasonal Operations Lower as Market Interest Lags

PHILADELPHIA, June 18—The curtailment in automobile production this month, although to some extent a normal seasonal development, has been accentuated by a pronounced slowing up of sales. This is attributed to Ford's announcement of an impending new model, as the lower priced classes have been affected most by the current apathy of buyers.

In most quarters it is confidently expected that the late summer this year will show a big sales expansion comparable to that of a year ago. Once uncertainty over new models is disposed of, it is held, the market will receive a marked stimulus.

The price situation is being most closely watched. There has been no evidence of a distinct price trend, although in the readjustment of schedules there may be one or two changes in the near future in addition to those recently announced. Most of the producers are against price cuts and some would make advances if the opportunity presented.

The manufacturing cost situation, both as to labor and materials, is favorable to lowered prices, but volume, except in a very few instances, has not made recessions feasible. Profits per unit are averaging lower this year than last, and even then most companies were on a very narrow profit margin.

The used car situation is better now than at the outset of the selling season, as was to be expected, but it is by no means satisfactory and increases in stocks to undesirably high figures later on in the year are predicted in many quarters.

Budd Shipments in May Close to Record Totals

PHILADELPHIA, June 13—May shipments of the E. G. Budd Mfg. Co. were $4,300,000, or almost $1,000,000 larger than in May, 1926, and close to the record monthly figure of $4,700,000 set up in September, 1926. For the five months ended May 31, 1927, shipments were $17,200,000 as compared with $16,600,000 in the corresponding months of 1926.

Inventories, which on Dec. 31, 1926, were carried at $8,900,000 were reduced to $6,800,000 on May 20, 1927.

Chevrolet Schedules 112,965

DETROIT, June 15—Chevrolet's production schedule for June is 112,965 cars. This will bring production for the first half up to 607,918 cars, and indications now are that Chevrolet's output for the year will exceed one million units.

Profitable Service Discussed at Forum

CLEVELAND, June 15—The automotive industry is now entering on its fourth stage of development. Beginning with experimentation and followed by production, the third stage, that of merchandising, is gradually being displaced by that of service. This was the keynote of the papers and discussion at the Service Managers' Forum of the National Automobile Chamber of Commerce held here this week.

Both the motor vehicle manufacturers and the dealers' problems in putting service on a profitable basis were discussed. The increasing importance of service in selling cars and trucks was presented by O. M. Breded, of Yellow Truck & Coach Mfg. Co. Bus maintenance was discussed by Pierre V. C. See of the Northern Ohio Power & Light Co. Two papers giving both sides of the question of whether shop equipment should be distributed through jobber channels or by car factory direct were presented respectively by Martin E. Goldman of the Greater Market Development Bureau of the Automotive Equipment association and R. A. Stougaard of Packard Motor Car Co.

Need of training service mechanics also proved a highly interesting topic of discussion, Professor John Younger, of Ohio State University, presenting a paper on the subject, while the successful methods used in the Cleveland trade school for automobile mechanics were gone into in detail by representatives of the school at the request of members.

Packard Favors Group Bonus

Group bonus payment of service station mechanics has been found profitable by the Packard Motor Car Co., according to a paper presented by H. C. Taylor, of the Packard service department. According to Percy M. Chamberlain, of the Automotive Equipment Association, flat rate servicing is now widely used but is not yet sold properly to the car owner. Addresses were also made by Harry M. Jewett, chairman of the N. A. C. C. service committee; Edward S. Jordan, president Jordan Motor Car Co.; Joseph B. Smith, of the Cleveland Automobile Manufacturers & Dealers Association, and Earl Turner, of the Automotive Electric Association, while interesting papers were presented by A. H. Prasse, the White Co., on handling replacement parts shipments; Dudley G. Frazer, Chevrolet Motor Co., on Chevrolet's service promotion program; D. E. Anderson, Bohm Aluminum and Brass Corp., on improvements in motor bearing construction, featuring interchangeable bearings, and H. O. Newton, Vacuum Oil Co., on when lubrication fails and why.

G.M. Sales in May Near April Mark

NEW YORK, June 16—Retail sales by General Motors dealers in May were 171,364 cars, an increase of 29,713 over May, 1926, but a decrease from the 180,106 total set up in April. Sales by car divisions to dealers in May totaled 173,182, which compares with 120,979 in May last year, and with 169,067 in April this year.

Tire Production Exceeds Shipments During April

NEW YORK, June 16—Production of tires and tubes of all types exceeded shipments in April, resulting in an increase in inventories over March. The inventory totals, however, were substantially lower than at the close of April, 1926.

Production of pneumatic casings of all types in April totaled 4,724,748 as against shipments of 4,276,464, bringing inventories to 9,091,787. This compares with 9,345,694 as of the same period last year. Production of tubes of all types totaled 5,529,936, with shipments totaling 4,769,385, bringing inventories to 13,351,406 as against 15,505,439 in April, 1926.

Over-Production Halts Ajax

TRENTON, N. J., June 16—Ajax Rubber Co., Inc., has suspended operations for a month. This action was necessary, the company announced, because of over-production.

Chandler Officer Dies

CLEVELAND, June 16—J. R. Hall, vice-president of Chandler-Cleveland Motors Corp., died at his home here this week. Mr. Hall had been in charge of production for a number of years and was regarded as one of the industry's leading manufacturing executives.

Grahams Take Over Jewett Interests

Final Action Places Paige in New Control—H. M. Jewett Long President

DETROIT, June 15—The Paige-Detroit Motor Car Co. has been officially passed to the control of the three Graham brothers, and the three Jewett brothers, whose holdings they purchased in the refinancing plan recently announced, have retired. The following officers have been elected by the newly created board of directors:

President, Joseph B. Graham; vice-president, Robert C. Graham; secretary-treasurer, Ray A. Graham; assistant secretary, Sherwin A. Hill, and assistant treasurer, O. W. Birnie. The board of directors now comprises the following: Joseph B. Graham, Robert C. Graham, Ray A. Graham, Z. F. Graham, John D. Biggers, E. D. Stair, Gilbert W. Lee, Sherwin A. Hill, and W. A. Wheeler.

Time allowed common stockholders to give necessary waivers recently expired and the plan approved unanimously at a stockholders' meeting, was made effective by the board of directors. The action sanctions the Graham purchase of approximately $4,000,000 of 7 per cent convertible second preferred stock, thus providing the company with substantial additional working capital.

Stock of the three Jewetts: Harry M., Frederick L. and Edward H. was also acquired and they have retired from the company with which they have been prominently associated since 1909. Harry M. Jewett, one of the Paige founders, was the second president of the company, serving from 1910 to 1926, when he became chairman of the board.

In an official statement telling of their acquiring control, the Graham brothers declare that the policy will be to continue the production of the Paige and six and eight-cylinder models in their various price fields. They also stated they will endeavor to support the merchandising organization now existing and progressively advance its interests.

National Spring Bought

DETROIT, June 15—The National Spring & Wire Co., of Grand Rapids, which has been in the hands of a receiver, has been purchased by a syndicate headed by George Wilkshire and J. L. McInerney and will be reorganized. The company manufactures Marshall cushion springs and conventional type springs.

Fageols Join Twin Coach

SAN FRANCISCO, June 13—Frank and W. B. Fageol have resigned as vice-presidents of Fageol Motors Co. to become officials of the new Twin Coach Co., and J. H. Fort and F. J. Wuepper have been elected to succeed them.

L. H. Bill, president of the Fageol company, reports the company doing excellent business, with truck production contributing a substantial part of operations.

Stutz Gives Buyers Insurance for Year

INDIANAPOLIS, June 15 — The Stutz Company announces the issuance of a free insurance policy to every buyer of a Stutz car, that will cover physician, hospital and similar fees in case of bodily injury to the owner or guests while riding in the Safety Stutz. The policy, issued by Lloyds, is good for a year and has a wide coverage in case of accidents. This includes accidents in which the car turns over or upsets, or in case of collision with stationary or moving objects.

The plan of operation in issuance of the insurance is as follows:

As soon as the Stutz factory receives the name of a new owner to whom a Stutz has been delivered, it notifies Lloyds, which issues the policy and sends it to the new owner. The year's coverage will take care of personal injury, fees and costs up to $1,200.

This free accident policy is in addition to the "loss of use" policy which pays the owner $5 a day in case of theft of Stutz cars, said C. Alfred Campbell, sales development manager. "The Stutz company has such faith in the safety features of its cars that it has procured this new free insurance policy for our owners.

"The experience in the one and one-half years in which the Safety Stutz has been on the road has been so favorable that the International Lloyds Co. has offered to sell this insurance at a price the Stutz Company can afford to pay."

Continental Net $147,085

DETROIT, June 16—Continental Motors Corp. reports net profit of $147,085 after depreciation, interest and Federal taxes for the six months ended April 30. This compares with $1,011,578 in the first six months of the former year. The reduction in earnings is ascribed to the costs of writing off of new model development and of the reorganization of the factory for manufacturing for new accounts.

Michigan Truck Sales Lower

DETROIT, June 14—According to statistics prepared by the Michigan Automotive Trade Association there were 2087 new commercial vehicles titled in Michigan in April, compared with 2337 for the same month, last year. The total number of commercial vehicles titled in the state during the first four months was 6119, of which 2742 were Fords, 1660 Chevrolets, 552 Graham Brothers, 176 Reo, 159 International, 131 Federal and 224 miscellaneous.

Business in Brief

Written exclusively for* AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co.

NEW YORK, June 16—Although better weather has aided trade and industry in some sections, seasonal recession is the general rule. Cotton textile manufacture, which has been perhaps less favorably placed than any other major industry in recent years, is now in a leading position. Both stock and commodity prices advanced last week, while money rates declined slightly.

FREIGHT CAR LOADINGS

The railway freight movement continues very large, car loadings in the week ended May 28 having numbered 1,026,397, which is 54,389 less than a year ago but 113,310 more than in the similar period of 1925. The gain over the total for the preceding week was 9594.

PETROLEUM OUTPUT

Crude petroleum production mounted to a new peak during the week ended June 4, averaging 2,507,300 bbl. daily, as against 2,498,300 bbl. in the preceding week and 2,009,450 bbl. in the corresponding period last year. Only minor changes in gasoline prices were announced last week.

BANK DEBITS

Bank debits to individual accounts reported to the Federal Reserve Board for the week ended June 8 were 12.5 per cent larger than the total for the preceding week (a holiday week) and 22.2 per cent above that for the corresponding period last year.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices stood at 140.4 last week as against 140.1 a week earlier and 139.6 four weeks earlier.

FEDERAL RESERVE STATEMENT

Bills and securities held by the Federal Reserve banks declined $29,000,000 during the week ended June 8, decreases of $97,200,000 in discounts and $7,400,000 in open market purchases having been largely offset by a gain of $75,600,000 in Government securities. Note circulation declined $23,700,000, while deposits increased $23,900,000 and reserves $16,100,000. The reserve ratio rose from 76.8 to 77.2 per cent.

During the same period, loans of reporting member banks declined 45,000,000, the decrease having been entirely due to a falling off in the amount of "all other" (mainly commercial) loans. Investments declined $21,000,000, borrowings from the Federal Reserve banks $87,000,000 and net demand deposits $74,000,000, while time deposits increased $39,000,000. Loans to brokers and dealers, secured by stocks and bonds, made by reporting member banks in New York City rose $57,000,000.

The call loan rate ranged between 4 and 4½ per cent last week, as against a fixed rate of 4½ per cent a week earlier.

American Chain Buys Control of Manley

Will Operate Company As Subsidiary With R. E. Manley As Head

YORK, PA., June 13—Controlling interest in the Manley Mfg. Co. passed to the American Chain Co. this week in a deal which has been under way for several months and which is to involve a consideration of more than $1,000,000. Robert E. Manley, majority stockholder in the Manley company, under provisions of the contract, will retain a substantial interest in the Manley company.

Under plans of American Chain company, the Manley organization will be retained intact, it was reported, the intention of the purchasing company being to operate it as a subsidiary company. With the Manley line of garage equipment added to the products of its other subsidiaries, American Chain will have a complete line of equipment and accessories, placing it in very strong position in this field.

The Manley company is widely known as a manufacturer of garage equipment, practically all of its products being the inventions of Robert E. Manley, organizer of the company and its president and general manager. Under the sale now effective, these patents are transferred to the corporation. The alliance is looked upon as making possible a large expansion in the products and markets of the company.

The personnel of the Manley company, which Mr. Manley will continue to head, includes O. S. Trone, secretary and treasurer; H. M. Smith, sales manager; L. G. Clingan, superintendent; F. M. Stambaugh, purchasing agent, and L. D. Yeager, production manager.

Company Organized in 1907

The Manley Mfg. Co. began in 1907 as the Device Improvement Co., an organization founded by Mr. Manley for the manufacture of several items of equipment pertaining to the maintenance of electric railway motors. Much of this equipment was a counterpart of the later garage equipment. In 1911 the company added the manufacture of farm gasoline engines of from two to 10 hp. and became known as the United Engine & Mfg. Co. In 1915 gasoline engine building was abandoned owing to tractors taking the place of stationary engines.

An early interest in automobiles led Mr. Manley to the discovery that equipment for their maintenance and repair was entirely inadequate and in 1914 he determined to enter the manufacture of garage equipment. Four items of the original line were developed in that year—a screw press, portable floor crane, motor stand and a portable work bench. With the introduction of this line the company grew steadily, the electric equipment business, however, continuing to be an important factor.

Following the war the electric equipment business dropped off to such an extent that in 1921 Mr. Manley disposed of it and concentrated upon the garage line. In the meanwhile, however, the company had moved from Hanover to its present quarters in York, the removal being made in 1919 at which time the company became the Manley Mfg. Co. The factory at the time of the sale to American Chain contained over 100,000 sq. ft. of floor space.

With Manley, American Chain will have three units in York, the others being a chain plant and a malleable iron foundry.

Jordan Awards Car in Slogan Contest

CLEVELAND, June 13—The Little Custom Jordan, offered as a prize for a slogan to be used in connection with its promotion, has been awarded to R. L. McGean of Cleveland, whose contribution was "A Glorious Challenge to an Eager Generation—the Little Custom Jordan." The contest for a slogan was held in connection with the recent Junior League Hermit Club show here.

Ilco-Ryan-Lite Aids Cross-Country Mark

RACINE, June 11—L. B. Miller, champion cross-country driver of America, who has just established another new record by driving from San Francisco to New York in 79 hr. 55 min., and immediately making the homeward trip, reaching Los Angeles at 9:59 a. m., June 7, undertook the feat in behalf of the Stover Signal Engineering Co., Racine, to demonstrate the Ilco-Ryan-Lite. Mr. Miller is sales promotion manager of the Stover Co., and he used a Chrysler roadster in crossing and recrossing the continent from May 31 to June 7.

In previous record-breaking runs from San Francisco to New York, Mr. Miller generally used two headlights, two spot lights and a ditch light, but on the latest double trip his car was equipped with but a single pair of Ilco-Ryan headlamps, enabling him to maintain daylight speed at night.

Czechs Buy More Tractors

WASHINGTON, June 15—The market for tractors in Czechoslovakia has been growing steadily since the war, with American makes far in the van, the U. S. Department of Commerce has announced. A single make of American tractor plow in 1926 accounted for 75 per cent of all imported makes.

N.Y. Registrations Show Drop in May

Total of 14,189 Compares With 14,798 in April—Chevrolet High Car

NEW YORK, June 13—Sales of new cars in the metropolitan district in May totaled 14,189, as compared with 14,798 in April and with 16,217 in May, 1926. For the first five months, sales in the metropolitan district totaled 50,661 as compared with 56,437 in the same period of 1926. The figures are released through Sherlock & Arnold.

Chevrolet sales in May totaled 2479 and for the first five months were 8040. Ford sales in May totaled 880 and for the five months were 3203. Whippet sales in May were 725 and for the five months were 2408. Essex sales totaled 728 in May and 2587 for the five months.

Registration totals for the five months showed Buick with 6235 in second place to Chevrolet, with Nash third with 4305, Chrysler fourth with 3588 and Studebaker fifth with 3373. Essex was in sixth place.

Stutz Sales Increase 72% in First Quarter

INDIANAPOLIS, June 14—Retail sales of Stutz Motor Car Co. of America, Inc., in the first quarter of 1927 were 72 per cent larger than in the same period last year. This rate of increase of the first quarter is continuing, according to E. S. Gorrell, vice-president, who shows shipments in the first 10 days of June as 40 per cent larger than for the same period in 1926 with dealer orders 65 per cent larger in this period over 1926. Shipments for June are expected to run 60 per cent in excess of June, 1926.

Welch Core Patent Upheld

DETROIT, June 14—Decision in favor of the American Plug Co., as owner, and the M. D. Hubbard Spring Co. of Pontiac, as licensee, in a suit brought in Federal Court here against Hudson Motor Car Co. for infringement of the Welch expansion plug patent, will not be contested further by the Hudson company. The cores that were held infringing were bought under protection of patent insurance, the Hudson company said.

Diesel Award in August

NEW YORK, June 13—Reports received by the American Society of Mechanical Engineers on its recent Oil Power Week, indicate that 106 meetings were held in 87 cities in all parts of the United States and Canada. At these meetings 88 papers were read, all of which were prepared especially for the oil power week observance. Announcement of the paper winning the Rudolph Diesel Award will be made Aug. 1.

I.C.C. Bus Report Nears Final Stage

Will Detail to Congress Conditions Under Which Vehicles Now Operate

WASHINGTON, June 14—The Interstate Commerce Commission will complete its report on the operation of motor buses and trucks in time to submit it to Congress at the opening of the regular session in December, Chairman John J. Esch announced here.

The report will deal with "the legality and propriety of the arrangements under which motor buses and trucks are operated; the rates, fares and charges for such services, and the provisions for filing schedules thereof, and the extent to which the traffic and revenue of carriers subject to the act are affected by the operation of motor buses and trucks."

In its last annual report the commission stated that questions relating to the operation of motor vehicles by or in connection with rail carriers has risen before it in formal cases and otherwise.

"These matters, as well as the fact that motor transport must be recogized as an important and rapidly growing factor in the nation's transportation system, prompted us to institute the present investigation in order that we may be in possession of needed information regarding motor bus and motor truck operations and may be able to transmit to Congress such information and data on this subject as may be considered of value in the determination of questions connected with the regulation of commerce, together with our recommendations thereon," the commission reported.

A.A.A. Bus Division to Protect Interests

PHILADELPHIA, June 17—Arrangements to combat any adverse recommendation which may be made by the Interstate Commerce Commission as a result of its investigation of the motor bus and truck traffic throughout the nation were made at the first annual meeting of the bus division of the American Automobile Association here this week.

The gathering was of far-reaching importance to the bus operating interests of the country. A definite program and policy was outlined and adopted for the first time with respect to the future of motor vehicle transportation in interstate traffic.

Interstate regulation of motor carriers was discussed by H. G. Wells, commissioner of public utilities of Massachusetts and first vice-president of the National Association of Railroad and Utilities Commissioners.

Car Excise Repeal in Minority Bill

WASHINGTON, June 16—Reduction of the corporation earnings tax to 10 per cent and repeal of the automobile excise taxes are included in a tax-relief program to be presented at the next session of Congress by Representative John N. Garner (D), of Texas, ranking minority member of the House committee on ways and means.

Low Detroit Sales Cut Michigan Total

DETROIT, June 11—Passenger car sales in Michigan in April totaled 19,847 compared with 24,587 for April, last year, according to statistics compiled by the Michigan Automotive Trade Association. Sales during the first four months of the year totaled 52,929 compared with 62,117 for the same period in 1926.

A study of the sales figures shows that the bulk of the loss in automotive sales in Michigan are being suffered in Wayne county, which embraces Detroit. In April, 6332 cars were sold in Wayne county compared with 10,509 in the same month last year. Sales in Wayne during the first four months were 18,628 compared with 26,722, last year.

Figures for the first four months reveal that Ford has lost heavily in sales volume in Michigan. Sales were 9673 compared with 21,777 last year. Chevrolet, on the other hand, has made large gains selling 12,935 cars during the first four months compared with 8010 last year. Dodge Brothers sales were 1535 compared with 4744 last year. Others in the medium priced field follow: Essex, 5525 compared with 3762; Pontiac, 3529 compared with 1326; Star, 603 compared with 1294; Whippet, 1785 compared with 1488; Chrysler 50, 1297 compared with 1374.

Oklahoma Sales Decline as May Comes to Close

OKLAHOMA CITY, June 11—The first part of May was by far the best part of the month for automobile men in Oklahoma according to released figures and survey. Near the last part of the month a lapse was felt by nearly all dealers. High and medium priced cars were in largest demand.

The general weather and humidity conditions were satisfactory for sales, however, but May is somewhat of an uncertain month in Oklahoma with business beginning a new cycle.

Used car sales and parts sales both made a very good showing for the month. In the truck field results were favorable due to new transportation and oil field lines being established.

Maryland Speed Law Studied for Effects

Increase in Accidents Will Bring Demand for Return to Old Limits

BALTIMORE, June 14—The automobile trade of this city and state is much interested in the results of the operation of a new speed law which became effective on June 1. The new law increases the maximum speed limit in the open country from 35 to 40 miles per hour; in cities and towns from 15 to 20 miles, and in outlying sections of cities and towns from 20 to 25 miles.

The last session of the General Assembly authorized the change over the protests of E. Austin Baughman, state motor vehicle commissioner who held the opinion that the greater speed would result in more accidents. As a result of the change he is making a careful check-up and has announced that should the increase be found responsible for a larger number of accidents he would ask that the law be changed to its original form. He also announced that although motorists usually were permitted a slight leeway when the maximum speed limit was 35 miles this will not be the case now and those found exceeding the 40 mile limit will be arrested.

The same law also increases the maximum speed for solid-tire vehicles to 25 miles an hour and for solid-tire vehicles weighing more than six tons to 20 miles.

Issues Half-Year License

Several other important changes in the motor vehicle law of the state also became effective June 1. Under the new provisions motorists will be permitted to display license plates for the ensuing year as early as Dec. 15. Heretofore the new markers were not permitted until noon of the last day of the old year. After July 31 motorists will be permitted to get licenses by paying one-half of the total yearly charge. Previously the full yearly charge was made no matter when application was made.

Provision also is made under which an appeal may be taken to the Circuit Court in cases where the motor vehicle commissioner suspends or revokes operators' licenses and this appeal acts as a stay of the order.

A number of minor changes have been made and are now in effect.

Sweden Develops New Fuel

WASHINGTON, June 16—Sulphite lye alcohol is being mixed with gasoline as a motor fuel in Sweden, the U. S. Department of Commerce has been informed. The mixture is used in approximately equal proportions and is considered by some to be superior to straight gasoline.

G.M.C. to Continue Liberal Dividends

Policy to Share Earnings With Stockholders Affirmed By Sloan

NEW YORK, June 13—Although the General Motors Corp. believes in financing its expansion as far as possible through the retention of earnings, this policy will not be allowed to interfere with the distribution to stockholders of a reasonable proportion of the profits, says Alfred P. Sloan, Jr., president, to stockholders commenting on the recent sale of preferred stock for $30,000,000.

Mr. Sloan points out that, in accordance with the principle set forth, in the period from Jan. 1, 1922, to Dec. 31, 1926, 54.49 per cent of the earnings of the corporation were paid out in dividends, a total of $261,722,503. The balance of the earnings, or $218,633,894, has been paid back into the business for development purposes, and to provide for future contingencies. He says further:

"The retention of profits by the corporation during the period up to the year 1926 was ample to meet the capital needs of the business. Due to the favorable reception that the products of the corporation received on account of the development of its activities in various directions, the expansion of its business during the year 1926 was very great. There naturally was required a large amount of additional capital. As a matter of fact, during the period beginning Jan. 1, 1926 and ending March 31, 1927, General Motors expended for additions and improvements in plans and for other permanent capital investment, including subsidiary and allied properties, a total net amount of $119,130,123. Obviously, it will be recognized that the expansion in volume of the corporation's sales has likewise necessitated very important increases in working capital requirements.

Ample Cash for Expansion

"Notwithstanding the fact that we are dealing in large amounts, the cash position of the corporation was such that there was no question but this entire development could have been financed without the sale of additional securities. This was because cash had been accumulated through the retention in the business of a substantial part of the accumulated profits during the previous two or three years. However, it was considered desirable to still further strengthen the corporation's cash position by approximately $30,000,000, which was provided through the sale at a premium of $25,000,000 par value preferred stock. It will be noted that this represents only 25 per cent of the total net additional amount invested in fixed assets and permanent capital investments during the fifteen months' period ended March 31, 1927."

In conclusion, Mr. Sloan says: "Naturally, what the future will bring forth can not at this time be stated, as it will depend upon future conditions which can not now be foreseen. The policy of General Motors can, however, be stated, and that policy is to distribute to the stockholders a reasonable proportion of the earnings, varying the distribution in proportion to the earnings, retaining the balance for ordinary needs of the corporation and to maintain the strength of its financial position. Should further expansion require capital in excess of a reasonable retention of profits, in that event a reasonable part will be financed through the sale of securities."

British Makers Buy Machine Tools Here

WASHINGTON, June 13—Great Britain is importing increasing quantities of high production machine tools, particularly for the automotive industry, from the United States, the U. S. Department of Commerce stated.

British automobile manufacturers have been modernizing their works and equipping them for production on a basis which should enable them to not only hold their home markets but also compete with American manufacturers in the colonial markets, the department announced.

Yellow to Center Work at Pontiac

DETROIT, June 13—General Motors Corp. is going ahead with its original plans to erect a large factory at Pontiac to house the activities of the Yellow Truck & Coach Mfg. Co., according to Paul W. Seiler, president of that company, who states that work will be started immediately on a factory designed to employ 5000 men. Approximately 1,250,000 sq. ft. of floor space will be included in the factory which will be used to manufacture the complete line of General Motors 1 to 15-ton trucks, Yellow taxicabs, Yellow motor coaches, and the engines, bodies and other necessary parts.

The plant is scheduled to be completed by Jan. 1, and will cost several million dollars.

Fuller Sales Gain 80%

KALAMAZOO, June 13—Shipments of Fuller transmissions in May were 80 per cent larger than in May, 1926 according to Fuller & Sons Mfg. Co. Releases against orders now on hand indicate no immediate falling off in customer demand. New equipment has been added in several departments.

Auburn Net to May Equals Former Year

Cash on Hand $2,800,000 With No Indebtedness—Greatest Growth Coming

NEW YORK, June 11—In connection with the declaration of Auburn Automobile Co. of the regular quarterly dividend, payable July 1 to stockholders of record June 20, E. L. Cord, president, made the following statement:

"During the first five months of the calendar year 1927, our production and sales of automobiles were almost equal to the entire production for the year 1926, and net earnings have been most satisfactory, closely approximating the total earnings for 1926. An audit of the company's books for the first six months of the present fiscal year ended May 31 is being made, and the actual results should be available for the stockholders' meeting June 22.

"As of May 31 the company is in an exceptionally strong financial position, having on hand cash or its equivalent (call loans, etc.) amounting to over $2,800,000 and no bank indebtedness. The company's production in 1925 doubled 1924, that of 1926 was 65 per cent ahead of 1925 and the first five months of 1927 nearly equal to the 1926 total.

"Since 1925 a large proportion of the earnings have been retained in the business as working capital, and it is felt that this policy has been greatly to the benefit of the stockholders."

Mr. Cord also stated that in his opinion Auburn's greatest growth would take place during the coming 18 months, which makes advisable a continuance of the same conservative policy. Mr. Cord refused to make any comment on the possibility of additional dividends.

Marmon Exports Triple

INDIANAPOLIS, June 13—Export sales of Marmon Motor Car Co. in the first five and one-half months this year show an increase of approximately 300 per cent over the first six months of 1926. Orders for June shipments indicate that this will be the largest export month the company has had. Included among May shipments were 50 cars sold in China. The number of dealers in export fields has been more than doubled since Jan. 1.

Kissel Exports Increase

HARTFORD, WIS., June 13—Kissel Motor Car Co. reports a large increase in export shipments in the first five months of the year. Indications are that 1927 will show the largest increase in export sales that the company has had. England, Norway, Switzerland, Germany, Roumania, Belgium and Holland are the company's best European markets. Australia and South American countries are also taking large shipments.

Plan Garage Chain to Promote Service

National Corporation Will Guarantee Work—Portland Men Sponsor Organization

CHICAGO, June 15—United Bonded Garages, Inc., a Delaware corporation capitalized at $300,000, has opened offices in Chicago at 310 South Michigan Boulevard, and has started a campaign to enroll approved garages throughout the United States in a cooperative chain for the promotion of profitable business.

Garages which become members of the chain must agree to give the customer who buys repair work from it a uniform receipt which serves as a guarantee of the work done. The member garage is bonded by a selected casualty company to make good any defective work originating in its shop either by doing the work over or paying another member garage for correcting the fault. Under the terms of the bond, as explained by J. W. Coates, manager of the Chicago office, any member garage failing to make good on its guarantee is subject to forfeiture of its franchise, whereupon the corporation will refund to the customer the amount of the bill involved and collect the amount from the indemnifying casualty company.

The United Bonded Garages, Inc., is planning an extensive national advertising campaign to direct motorists to garages displaying the sign that will identify them as members of the chain. This campaign will open with a full page in one of the national weeklies July 9 and will be supported by large space in metropolitan newspapers. A business paper advertising campaign also is being planned to acquaint the automotive trade with the merits of the system.

Garages joining the chain will be required to pay $29.50 with application covering 60 days' service and $12.50 a month thereafter. The complete service will include merchandising and accounting helps in addition to literature, road signs, garage signs and the benefits of the national advertising campaign.

The corporation was organized by a group of business men of Portland, Ore., headed by Edward J. Jaeger, who is president. The vice-president is H. J. Cress, and the secretary and treasurer is Fred A. Schlick. The directors are all Portland business men.

Within two weeks of starting operations the company has about 200 applications for franchises from garages in 12 states.

Open New Air Mail Bids

WASHINGTON, June 14—Bids for four new contract air mail routes will be opened July 16, the U. S. Postoffice Department announced this week.

The proposed routes are from Albany to Cleveland, via Schenectady, Syracuse, Rochester and Buffalo; from Dallas to San Antonio, via Waco and Austin; from Key West to Havana, and from Cleveland to Louisville, via Akron, Columbus, Dayton and Cincinnati.

Contract for the Cleveland-Louisville route was awarded to the Kaess Aircraft Corp., but was cancelled on May 4, without the service having been established, following an investigation by postal inspectors.

Kelly Named Specialist for Industry in Europe

WASHINGTON, June 13—The promotion of Trade Commissioner H. H. Kelly, of Braddock, Pa., to be special automobile trade commissioner of the U. S. Bureau of Foreign and Domestic Commerce in Europe was announced here this week by Acting Director O. P. Hopkins.

Commissioner Kelly has been in the Paris office of the Department of Commerce for more than two years and has devoted his time almost entirely to the automobile trade. He is president of the American Automotive Club of Paris, which includes European representatives of 30 leading American automobile companies. Before entering the field service Mr. Kelly was assistant chief of the automotive division of the department here.

Commissioner Kelly will continue to make his headquarters in Paris but will cover the entire European territory, which forms the most important export region for American passenger cars, trucks and buses.

Falcon Sets Day Record With Shipment of 176

DETROIT, June 14—Falcon Motors Corp. established a new production record on June 10 when 176 Falcon-Knight cars were shipped. Retail sales and unfilled orders for the first week of June are 50 per cent higher than any week since introduction of the Falcon-Knight line in April, according to John A. Nichols, Jr., president.

Commenting on business conditions, Mr. Nichols said the Middle West, Southwest and South, which have been quiet during the winter and spring months, are now showing greater activity. The dealer organization of the company is nearly complete in the central and eastern states and on the Pacific Coast.

Ford K. C. Plant Closed

KANSAS CITY, June 13—The Ford Motor Co. assembling plant here has closed, factory officials stating the shutdown probably would last two or three weeks. No information has been given as to what is being done at the plant but some of the regular workmen are being employed and the understanding is that the plant is being tooled up for the new model Ford car. The plant has been employing 300 to 400 men the last few months. Prior to that a force of more than 1000 was employed.

Liability Insurance Brings Loss in 1926

Increased Traffic Congestion and Higher Judgments Believed Responsible

NEW YORK, June 14—Automobile public liability insurance, hitherto considered particularly desirable by underwriters, last year for the first time in four years showed a loss despite increased volume and a lower acquisition cost.

In 1926, according to figures of the National Bureau of Casualty & Surety Underwriters, the total earned premiums were $108,834,488 and combined losses and expenses exceeded this figure by $1,329,073, an underwriting loss of 1.2 per cent. This compares with $97,288,462 earned premiums and an underwriting profit of $4,901,291 or 5 per cent in 1925. In 1924 earned premiums were $87,033,991 and profit was $6,107,997 or 7 per cent, while in 1923 premiums were $70,079,499 and profit $5,306,659 or 7.6 per cent.

The company managers and underwriters are not entirely agreed as to causes for the turn in business from a satisfactory profit to a loss but are inclined to believe that increased traffic congestion and the tendency of the courts toward higher judgments are mainly responsible.

The unfavorable showing developed in the automobile public liability is not due to increase in acquisition cost, as that factor has been steadily reduced from 1925, when it was 27.4 per cent to the low level of 25.6 per cent in 1926. On the other hand, the loss ratio has steadilly risen from 25.6 per cent in 1923 to 53.8 per cent in 1926.

The national bureau's statistics reveal that only a relatively small percentage of automobiles registered are covered for public liability, the 1926 ratio being about one in six, but that is an improvement compared with the previous year, when the ratio was one in seven. This ratio, however, does not obtain in the large centers where the rates of cars covered for public liability is about one in three.

Westinghouse Chairman Dies

NEW YORK, June 14—Brigadier General G. E. Tripp, chairman of the board of Westinghouse Electric & Mfg. Co., died here tonight of complications following an operation. He was 62 years old. General Tripp was a director also of American International Corp., American Sugar Refining Co., Martin-Parry Corp., Chase National Bank, Pittsburgh Meter Co. and the Radio Corp. of America.

Wheel Directors Named

DETROIT, June 13—Clarence B. Hayes of Jackson, and Henry Rudkin of New York, have been elected to the board of the Kelsey-Hayes Wheel Corp.

Truck Men Discuss Mutual Insurance

May Form Company in Massachusetts to Bring About Premium Saving

BOSTON, June 11—At the annual meeting of the Motor Truck Club of Massachusetts last night the problem of truck owners under the Compulsory Insurance Law was discussed from many angles, and Charles J. Innes, one of the leading attorneys of Boston, explained how it would be possible to get lower rates. He cited facts and figures on the way to get premiums 50 per cent less than the state allows insurance companies to collect if the truck men form a mutual liability insurance company. After the discussion ended a committee on insurance was selected headed by H. D. Church, which was given power to further investigate the problem and report at an early date on the necessary steps to change conditions.

At the meeting it was brought out that a number of truck owners have been put out of business through the high insurance and registration taxes and it meant a lot to the truck men to get reasonable premiums. The case of some taxicab operators banding together this way was cited as an instance of what might be done.

At the election of officers James J. Scully, who has been president since the organization was formed some years ago, was elected again unanimously. Other officers elected were H. Arthur Hall and John H. Smith, vice-presidents; George H. O'Brien and Irving Malkins, directors, the others being Messrs. Church, Borden, Clark and Dillon. Day Baker was reelected secretary-treasurer and legislative advisor. His report on legislation showed that the truck owners this year were treated better by the Bay State lawmakers than ever before.

Adopt Connecticut Law

BOSTON, June 11—New Hampshire, Vermont and Rhode Island have refused to follow the lead of Massachusetts with a compulsory insurance law. New Hampshire had a bill exactly like the Bay State one, but after sending people to Boston to get some first hand information its legislature turned to the Connecticut "Financial Responsibility" statute and that was passed. When Vermont considered the law it followed New Hampshire's lead. And now Rhode Island has joined the other states by passing the Connecticut law making four New England States operating under it.

Drinkers Lose Insurance

BOSTON, June 11—By a recent decision of the board of appeals on the compulsory insurance law in operation in Massachusetts it was decided that when an insurance company had evidence that any motor operator it was covering with a policy was given to driving under the influence of liquor it could revoke the insurance. One company did this and the motorist appealed. It was brought out in the hearing that insurance companies were making some investigations regarding drivers, and after persons had been arrested for driving while under the influence of liquor some were able to have their cases placed on file. They were notified that their insurance was dropped. Now the matter has been settled definitely by the state insurance commissioner and his board of appeals.

Bay State Insurance Cuts Registrations

BOSTON, June 11—Motor car and truck registrations in Massachusetts up to June 1, completing the first six months of the state fiscal year, shows that while car totals increased less than 1 per cent the loss of trucks totals was 9 per cent.

May took a decided downward curve the loss being 16 per cent. This was divided between a loss of 9035 cars, or 13 per cent, and 1740 trucks, or 31 per cent. When it is considered that in April the increase had pyramided so that the deficit of the early months was wiped out it began to look then as if the corner had turned. May started off with April's lead giving the spring months a lead of 15,395 cars, but the loss of 8042 trucks for the same period brought the total increase down to 7353. May showed a decrease of 10,775 under May of 1926.

There is no doubt but what the compulsory insurance law has had much to do with this drop. Taxicabs have dropped from 818 last year to 374, or about 54 per cent. Owners could not stand the high insurance rates. And owners of small cars, that were registered for $10 a year ago and now have to pay $41 in the Boston district, are less numerous. It is the same story with truckmen whose average for insurance and registration taxes is around $400.

Chicago Equipment Mart Closed by Association

CHICAGO, June 11—The Automotive Equipment Mart, which has been operated for the last two years by the Automotive Manufacturers Association at 1315 South Michigan Ave., as a permanent exhibit of automotive accessories and equipment, has been discontinued. Although about 100 manufacturers maintained exhibits at the mart it was not self supporting and the directors of the association decided to close it.

The Automotive Manufacturers Association, which was organized in 1916, will be continued and its entire facilities will be devoted to extending and enlarging the sales and credit reporting services which have been highly valued by the members in the past. W. E. Green is secretary of the association.

Roller Bearings Add Five Cars to Flyer

C. M. & St. P. Limited Now Third of Mile Long—To Add New Trains

MILWAUKEE, June 11—Remarkable results from the use of roller bearings in railroad axles have been disclosed by operation of the Chicago, Milwaukee & St. Paul's Pioneer Limited, the first complete installation of this kind in railroading. The new Pioneer went into regular service May 21.

Since that time the limited has been operated with 19 coaches on the exacting time schedule with but one locomotive and without the aid of a "pusher" engine in starting. Under old standards, 14 coaches was the maximum. Roller bearing coaches to the number of 20 could be handled in a single train, Milwaukee road engineers say, but the danger of coupling breakage from the tremendous weight is declared to be too great.

A 19-coach train means more than 1400 feet of cars, or to exceed a third of a mile. When stopping in Milwaukee each day, the last coach is more than two blocks from the station platform, necessitating careful planning to enable passengers to reach cars "without taking a taxi." This creates an interesting problem for railroad engineers planning future terminals, it is stated.

A striking improvement in the comfort of passengers when starting and stopping, as well as when roller trains are under way, is also noted.

The Milwaukee expects to put in service about July 1 the second new train with roller bearings—the transcontinental flyer Olympian, Chicago to Seattle daily. There also is under construction by the Pullman company a third transcontinental train, the Columbian, Seattle to Chicago daily. All of the new trains ride on Timken units, developed from automobile types for the heavier service of railroad travel.

Exports to Asia Increase

WASHINGTON, June 14—Marked increase in American exports of automobiles and trucks to southeastern Asia during the first quarter of this year is reported by the U. S. Department of Commerce. Total imports of both classes were 2182 units, of which the Dutch East Indies took 1403. Nearly 35,000 rubber tires, tubes and casings were imported.

Rubber Imports Increase

NEW YORK, June 13—Importations of crude rubber in the United States in May totaled 36,359 long tons, according to the Rubber Association of America, Inc. This compares with 30,411 in May, 1926. The total for the first five months of the year was 193,656 tons against 178,530 in the corresponding period a year ago.

Engine and Bodies Refined by Essex

Displacement is Increased and Bearings Larger — All-Steel Sedan Added

DETROIT, June 18—Changes in the Essex Super Six comprising an increase in stroke giving 8½ cu. in. more piston displacement, a heavier crankshaft and altered body lines are announced by Hudson Motor Car Co.

The bore and stroke are now 2 11/16 by 4½ in. giving a piston displacement of 153.2 cu. in. as compared with 144.7 cu. in. formerly. The main crankshaft bearings have been increased in size. Changes in body lines comprise the rounding off of the rear quarters of the closed car. The wheels are an inch smaller than formerly with 30 by 5 balloon tires. The rear axle gear ratio has been decreased.

The right front seat of the coach is mounted on a mechanism which allows it to slide forward sufficiently to permit passengers to reach or leave the rear seat without disturbing the front seat rider. A new four-door sedan with a steel body, priced at $835, will take the place of the former four-door and de luxe sedans, which were listed at $795 and $875 respectively.

Following are list prices and finishes of the new Essex sedan and phaeton models: Five-passenger sedan, $835, two-tone gray, molding deep green, edged with white; five-passenger phaeton, $835, body in gray, molding in green with black center stripe and edged in cream.

Falcon Sales Run High in Southern Territories

DETROIT, June 11—A healthy and growing retail demand for Falcon-Knight cars in the southern states is reported by the Falcon Motors Corporation, which says that during the first month, retail deliveries in the Atlanta territory place Falcon in eighth place.

"In allotting our production for the first six months," said F. H. Akers, general sales manager, "we had anticipated a very slow demand from the southern states due to unfavorable cotton prices. In Atlanta, New Orleans, San Antonio and a number of other southern territories our dealers report a very satisfactory demand.

"Retail sales in Florida also have been surprising."

May Retail Sales Off 3%

WASHINGTON, June 15—Retail sales in May, indicative of general business conditions, showed a decrease below those for May, 1926, averaging nearly 3 per cent, the Federal Reserve Board announced this week. Sales, as reported by 629 stores, were smaller in all Federal Reserve districts except those of Dallas and San Francisco.

Wolverine Expands Territory for Reo

LANSING, June 13—According to Clarence A. Triphagen, general sales manager of the Reo Motor Car Co., Reo's dealer organization will be expanded 25 per cent during the next eight months. Reo's entry into the more popular price field, with the Wolverine as a companion for the Flying Cloud, is opening up much new territory for the company. Besides reflecting favorably in passenger car sales, this should also stimulate commercial car prospects, said Mr. Triphagen, who reports the keen demand for Flying Cloud and Wolverine as continuing at an undiminishing pace.

Kelsey-Hayes Shows $27,878,182 Assets

NEW YORK, June 13—Pro forma consolidated balance sheet of Kelsey-Hayes Wheel Corp. and subsidiaries as of December 31, 1926, after giving effect to the increase in common stock and to liquidation of Hayes Wheel Co. and to acquisition of net assets of Hayes Wheel Co., as set forth in the contract dated April 29, 1927, follows:

Assets: Land, building, equipment, etc., after reserve for depreciation and depletion, $9,185,153; trade name, patents and good-will, $9,543,237; investments, $383,324; inventories, $4,317,508; notes and accounts receivable less reserve, $1,689,687; cash surrender value life insurance policies, $193,541; U. S. Liberty and Canadian government bonds, $1,231,472; cash, $943,951; deferred charges, $390,309; total $27,878,182.

Liabilities: Preferred 7 per cent cumulative stock (par $100), $2,039,500; common stock represented by 398,522 no par shares, $12,808,259; accounts payable, $592,699; accrued payrolls, taxes, royalties, etc., $229,997; provision for Federal and Canadian income taxes and bonuses, $251,273; cash portion of purchase price available for net assets of Hayes Wheel Co., $2,955,660, reserve for contingencies, $361,579; surplus, $8,639,215; total, $27,878,182.

New Companies Insure Cars

WASHINGTON, June 13—The automobile insurance business has entered the cooperative farm insurance field on an extensive scale, it is revealed in a report by the U. S. Department of Agriculture, covering the activities of mutual insurance companies in the field of agricultural cooperation. Four such organizations are now operating, one of them in eight states, and are rapidly enlarging their territory of operations.

Velies Again Active in Company Affairs

W. L. Velie, Jr., Tells New England Dealers of Increasing Operations

BOSTON, June 11—Vice-President Willard L. Velie, Jr., of Velie Motors Co., came to Boston this week to address the dealers operating under the New England Velie Co. President Amos J. Shorey of the latter company, opened the meeting by giving an outline of Velie sales in this territory, pointing to the fact that Velie sales had increased in Massachusetts this year more than 50 per cent.

"We have started on a new era at Moline," Mr. Velie said. "W. L. Velie, Sr., has regained his health after several years of semi-illness and now he is back on the job 100 per cent and giving the company the same energy and skill that brought his previous enterprises to success before he went into the automotive business. Our indebtedness has been wiped out. We have ample working capital. Our dealers are selling cars. We do not expect to pull the big production leaders down from their pedestal, but we are climbing now and intend to keep on doing it.

"At a drive-away a few days ago at Moline scores of dealers were present and they formed a parade, headed by a band, with Mr. Velie, Sr., in the first car, followed by the 125 cars being taken away. That shows how Velie is doing. Other driveaways are planned. Our increase in sales is general and our best sign is that many are applying for the Velie dealer franchise."

Willard L. Velie, Jr., is now back at the factory from the Chicago branch, and he is in the sales department since its reorganization with the resignation of E. McEwen, who had been directing Velie affairs for the past few years.

Graham Sales 4718 in May

DETROIT, June 11—Shipments by the Graham Brothers division of Dodge Brothers, Inc., reached the high point of the year in May, totaling 4718 as compared with 4055 in April, the best previous month. The figures included shipments in the United States and abroad. Company officials believe the high volume will be continued, basing their belief on the reception the public is according the new four-cylinder engine, recently announced.

Hudson Resumes "on High"

DETROIT, June 11—Following a lull in production to make certain factory changes, the Hudson Motor Car Co. will resume heavy schedules Monday, with 850 Essex cars a day and increasing 100 cars a day until 1350 daily, or the July schedule, is reached. The new schedule for Hudsons will be 300 a day.

Men of the Industry and What They Are Doing

Studebakers to Observe Founding of Corporation

A reunion of the Studebaker family will be held Sept. 15 at South Bend to memorialize the founding of the Studebaker Corp. by the five Studebaker brothers, 75 years ago. Mrs. Anne Studebaker Carlisle, daughter of the late Clem Studebaker, will preside at the reunion, assisted by A. R. Erskine, president, and Paul G. Hoffman, vice-president, of the corporation.

Membership in the Studebaker National Reunion is open to any person who has the name Studebaker, regardless of spelling, and to any person who by blood or marriage is related or affiliated with the name in any manner. The history of Studebaker as a family name will be written from the records developed through the reunion.

Link Belt Names Officials

R. P. Shimmin has been appointed assistant to the chairman and to the president of the Link-Belt Co. and will make his headquarters at 910 South Michigan Ave. Frank B. Caldwell has been appointed sales manager with headquarters at the Chicago plant. He will have supervision over all sales activities in the western division.

White Holds Annual Dinner

The White Motor Co. annual dinner for 250 executives, department heads and employees, was held this week at Chesterland Caves on President Walter C. White's farm. Baseball, foot races and a golf driving contest preceded the dinner which was served in a dance hall near the caves.

Parmenter Joins Heil

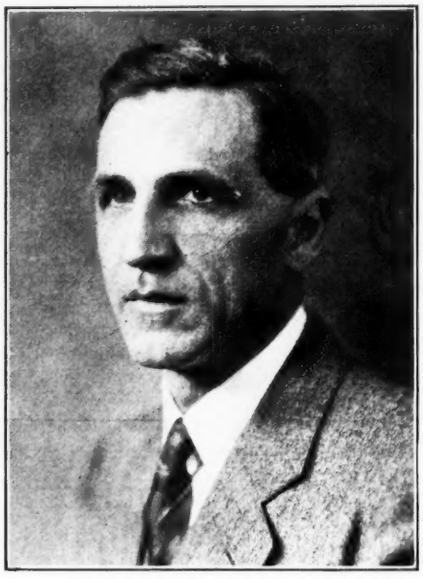
R. E. Parmenter of Chicago has been appointed advertising manager of the Heil Co., Milwaukee. He succeeds Arthur Nicolaus, who died recently. Mr. Parmenter formerly was business manager of Carroll College, Waukesha, Wis., and was with the Weis Fibre Container Corp., Monroe, Mich., more recently being with the Meads Sales Co., Chicago.

Snow Leaves Velie Post

Herbert C. Snow, for the last three years chief engineer for Velie Motors Corp., has resigned his position. His successor has not been appointed. Mr. Snow made no announcement of his future plans except that he is considering another position.

Fitzpatrick Heads Export Club

The Export Club of Detroit has elected Samuel Fitzpatrick, export manager of the Federal Motor Truck Co., president for the coming year. The club's membership is growing rapidly and expects to have 100 on the roster by fall.



John C. Talcott

New chief engineer of Pierce-Arrow Motor Car Co., succeeding the late Charles Sheppy

Cline Returns to Chicago

Stanley C. Cline, who for the last two years has been sales manager of the Gabriel Snubber Mfg. Co., Cleveland, has returned to Chicago to again become associated with the Gabriel Snubber Co. of Chicago. Mr. Cline was with the Chicago company before going to Cleveland. He will direct the sales organization of the company which is the exclusive distributor of Gabriel Snubbers and Pines Winterfronts in Cook and 14 surrounding counties.

Rockwell Answers Army Call

W. F. Rockwell, president of the Wisconsin Parts Co., Oshkosh, Wis., was called to active duty as a major in the Officers' Reserve Corps on June 1. He has gone to Washington for an indefinite period. Major Rockwell has been connected with motor transport work for many years, beginning some time prior to the war.

Werner on European Trip

F. J. Werner, chief body engineer of the Kissel Motor Car Co., has sailed for Europe for a three months' visit, combining business and recreation. He is accompanied by his family. He intends to visit the leading automobile plants in England, Germany and France.

Green Joins Contact Company

Paul C. Green has been appointed sales manager of The Contact Corp., Waukesha, resigning from the Hub City Iron Works to take over the new position.

G.M. Export Executives Return from Trips Abroad

L. M. Rumely, general manager of the General Motors Export Co., who has been in Australia for the past three months, will arrive back in New York some time this month. Harry Tipper, general sales manager, will return to New York from Europe toward the end of the month. R. K. Evans, regional director for Europe, and J. H. Dreibelbis, regional director for South America, will arrive in New York about July 1.

N. C. Tuxbury, vice-president of General Motors Export Co., has sailed for Hawaii from Los Angeles, P. L. Griffiths, treasurer of General Motors Peninsular, and J. F. Todd, sales manager of that operation, have returned to Madrid after spending several weeks in New York. J. B. Williams, regional treasurer for Europe, who spent several weeks at the New York offices, has returned to Europe.

Beatty Back From Europe

W. J. Beatty, foreign sales manager of the J. G. Brill Co., who has just returned from a foreign tour, told members of the Export Club of the Philadelphia Association of Credit Men that unemployment in Great Britain and France is being overcome partially. The business outlook in France is mixed, he said, and conditions in England are improving.

Dean Heads Selden Service

John R. Dean has been appointed service manager of the Selden Truck Corp. George Foos, for many years connected with the service department of the company, has been promoted to assistant service manager.

Boyle on Aluminum Staff

James J. Boyle has been appointed a member of the sales force of Aluminum Industries, Inc., covering the territory made up of Ohio, Kentucky, West Virginia and western Pennsylvania.

Moses With S & M Lamp

D. G. Moses has been appointed representative of the S & M Lamp Co., Los Angeles, in the Illinois, Indiana, Michigan, Ohio and Wisconsin territory.

Crego Smith Sales Manager

R. F. Crego has been appointed sales manager of the L. C. Smith Bearings Co., Chicago, succeeding N. C. Gove, who has resigned to operate a business of his own. Mr. Crego had been connected with the Smith company for three years previous to his promotion to the sales managership.

3rd Quarter to See Steel Market Test

Producers Find No Price Resistance Now—See Long Range Buying Past

NEW YORK, June 16—Steel company sales executives and automotive purchasing agents are agreed that the real test of the sheet market will not come until the third quarter. Automotive consumers have specified in the last few weeks against contracts carrying old prices to their full extent and there has been a certain amount of small tonnage buying and filling in at the newly quoted price levels. The leading motor car manufacturing interest is reported to have placed some business on the 3-cents-a-pound basis for black sheets.

Steel producers characterize the higher prices recently announced by them as "still low," but express gratification at the absence of greater resistance to the advance than is in evidence. The impression which it is sought to create in some quarters, however, that buyers have approved of the higher asking prices hardly reflects their true state of mind. Developments over the next month or two will show whether there is enough demand to give a fair share of business to all rollers. If there is not, then some of the rollers will have to go gunning for business with concessions as ammunition.

Meanwhile, the market for full-finished sheets, in which quality always plays a more important part than in ordinary sheets, shows a relatively stronger tendency. Significant, however, is the fact that sheet bar mills have apparently dropped all idea of advancing the price for that semi-finished description of steel for third quarter delivery.

This shows that sheet-bar producers take the position that sheet rollers had to advance their base price on black to 3 cents to avoid losses, but that this does not imply a rising sheet market warranting higher sheet-bar price levels. The decline of 405,191 tons in the leading interest's latest unfilled tonnage statement, leaving the lowest backlog in 16 years, is interpreted as reflecting complete liquidation of the change from long-range to hand-to-mouth buying.

Pig Iron—Small sales in the foundry iron market are the only activity, with automotive foundries seemingly having carried over considerable iron from last month. While prices hold fairly steady, consumers can get their choice of brands and shipping dates, but they are seemingly not greatly interested in offerings at this time.

Aluminum—Specifications against old orders run moderate. Motor car manufacturers and parts makers are hesitant about taking on material before it is actually needed in their operations. The secondary metal market is softer and remelted metal is offered at as low as 24 cents. World production and capacity appear to have more than caught up with demand, as shown by the fact that in Norway new expansion plans are being shelved for the present. Italy, consuming about 7000 tons a year, will be self-contained in the matter of aluminum supply a year hence.

Copper—Demand is light and the market shows no improvement. Waterbury and Michigan rolling mills are moderately busy on automotive brasses.

Tin—Comparative quiet and steadiness prevails. Spot Straights tin is rather scarce and commands a premium.

Lead—Storage battery manufacturers have been buying freely of late, especially for July delivery. The market is firm.

Zinc—The undertone of the market is stronger and slightly higher prices are looked for before the end of the week.

Rubber Price Drops to Below 36 Cents

NEW YORK, June 16—The rubber market this week again dropped after the most substantial break in several months. Last week brought prices down 2½ to 3 cents a pound. Present levels are slightly under 36 cents a pound.

In explanation of the break, a number of rumors or surmises have gained circulation and several of them, if true, are of considerable importance to the industry.

It has been persistently reported that the British will abandon restriction of rubber exports. There is no official word on this point, however, and there has been no indication that the British government is dissatisfied with the recent operation of the Stevenson plan.

Some fear has also been expressed of the general reduction in the price of tires. Why this should bring down the price of crude rubber is not explained. However, in the tire trade it is said that the recent cuts on small size tires is the extent of the reductions currently contemplated.

The third factor affecting sentiment in the rubber market was the report from Detroit that employment had reached a new low level for the year.

G.M. Exports Reach Peak in 1st Quarter

NEW YORK, June 17—Sales of General Motors cars to overseas dealers in the first quarter of the year were larger than any quarter in history according to A. P. Sloan, Jr., president of the corporation. The total for the three months ended March 31, was 39,443 cars and trucks as compared with 31,936 in the same quarter last year, and with 32,195 in the final quarter of 1926.

Sales by quarters for the past three years were as follows:

Period	1927	1926	1925
1st Quarter	39,443	31,936	15,577
2nd Quarter		31,861	26,277
3rd Quarter		22,799	25,906
4th Quarter		32,195	33,134

Financial Notes

Westinghouse Air Brake Co. will vote Aug. 17 on a proposal to change the present authorized capital stock of 1,000,000 shares, par $50, into 4,000,000 shares of no par value. The company has outstanding 793,027 shares of stock, making a total capitalization of $39,651,381. It is the intention to transfer $7,930,276 from surplus to capital stock, bringing total stated capital to $47,581,660 and simultaneously to issue to stockholders four shares of no-par stock in exchange for each share of $50 par value stock now outstanding.

Bendix Corp. has issued $1,200,000 five-year secured 6 per cent sinking fund gold notes. The offering is being made through Paul H. Davis & Co., Union Trust Co. of Chicago, and the Continental & Commercial Co. The Bendix Corp., organized in 1924, is the parent company of the Bendix Brake Co.

Kelsey-Hayes Wheel Corp. filed with the secretary of state a certificate of an increase of number of shares from 130,000 of $10 par value to 420,324 shares, of which 20,324 are preferred $100 par value and 400,000 shares are common without par value.

Mullins Body Corp. reports May profit of $60,000 after charges but before Federal taxes. Profit for first five months of 1927 totaled $272,000. As of May 31, 1927, current assets were $1,720,000 and current liabilities $328,000.

Employment in Industry Shows Reduction in May

WASHINGTON, June 16—A slight decrease in employment occurred in the automobile industry during the month of May and many automobile factories curtailed their operating schedules, it was announced by the U. S. Employment Service, Department of Labor, in the monthly bulletin. The same conditions were observed in several other major industries.

In Michigan employment in the automobile industry showed very little change, although a few of the larger factories in the state operated only four days a week. At Flint, however, there was a shortage of toolmakers, tool designers and die sinkers in the automobile industry.

Increased employment in the automobile industry is anticipated with the production of new models.

Mack Opens New Branch

ROCHESTER, June 14—The new home of Mack trucks here was formally opened with a reception and housewarming. C. J. Auert, branch manager, headed a reception committee composed of M. J. Katzmark, C. E. Lopez, H. R. Jackson, T. W. Coley, T. J. Linke, Harold W. Tice, W. L. Smith and George F. Minkel. The building will house all sales and service activities in this territory operating as a direct factory branch.

French Engineers Study Stroborama

PARIS, June 1 (*by mail*)—The use of the stroborama in the automotive industry, by Laurent Seguin, and tests in connection with a theory on front wheel shimmy by M. Ziembinski, of the Delaunay Belleville Co., were the two subjects brought before the French Society of Automotive Engineers at its meeting held here yesterday.

Laurent-Seguin considerably interested the audience by practical demonstrations of the use of his stroboscopic apparatus for studying, by means of synchronized and intensive lighting, the movements of object in motion, as recently described in AUTOMOTIVE INDUSTRIES.

At the next meeting of the French society, Charles Faroux, who has just returned from a visit to the United States, will lecture on what he saw in the American automotive industry.

Speed Record for Hour is Increased to 128.349

PARIS, May 30 (*by mail*)—Covering 128,349 miles in sixty minutes, Marchand, in a straight-eight sleeve valve Voisin, captured the world's hour record this week on Montlhery track. He clipped 1.764 miles off the previous record set up last December by E. A. D. Eldridge in a 122 in. straight-eight Miller.

The Voisin used for this record performance has a straight-eight Knight type sleeve valve engine of 3.74 by 5.5 in. bore and stroke delivering its maximum power at about 2600 r.p.m. It is fitted with two Zenith carburetors attached direct to the cylinder block, the air being admitted to them through a Tecalemit air filter and a long aluminum manifold. This air manifold is used to avoid disturbance of the mixture when on the banking. It was with the same car that Marchand broke the 100 kilometres and 100 miles record a few weeks ago.

Exports Take Half of U. S. Motorcycles

WASHINGTON, June 15—Half the United States output of motorcycles during the past year was shipped abroad, Australia, Japan, Sweden and Germany forming the largest markets for this type of vehicle, a survey by the U. S. Department of Commerce shows. The total output in 1926 was 42,000 machines, of which 22,670 were exported.

National Air Races Awarded to Spokane

SPOKANE, June 10—The national air races for 1927 will be held in Spokane, Sept. 23 and 24. The national air derby from New York to Spokane and from San Francisco to Spokane will be held on Sept. 19.

U. S. Ends Air Mail July 1

WASHINGTON, June 15—Direct Federal operation of the transcontinental air mail service will come to an end between July 1 and Aug. 1, the Postoffice Department announced this week. Private contractors for the western section of the route between Chicago and San Francisco have expressed their willingness to take over the service in July, while those who will operate the eastern half will be ready to undertake contract service about Aug. 1.

India Shipments $970,000

WASHINGTON, June 14—United States exports to India during the first quarter of 1927 included $970,000 worth of automotive products, it was announced by the U. S. Department of Commerce.

Steam Car Pioneer Killed in Accident

BOSTON, June 11—Louis S. Ross, a pioneer builder of steam motor cars and one of the star drivers years ago, was killed yesterday while conducting an experiment near his factory at Waltham. He was head of the Central Railway Signal Co., that makes torpedoes, flares, etc., for railroads.

Mr. Ross came into automotive notice back in 1903 and 1904 when he built steam racing cars after having driven some of the Stanley machines. At Readville and Providence he won several events, but it was not until he went to Florida that he attracted international attention. In 1904 he cleaned up the races there with his "Wogglebug" shaped like a canoe upside down. He won the Sir Thomas Dewar and other trophies.

After Mr. Ross defeated all the stars from home and abroad at Florida, Henry Ford challenged him to race for the Sir Thomas Dewar trophy. Mr. Ross was willing but no date was ever set for the event. He was one of the first drivers to turn a mile under one minute. Racing lost its glamour for him and he began building cars. The first motor car ever used by the Boston Fire Department was built in his shop. He closed his automotive building in a few years and turned his attention to inventions developing the company which he headed when he died.

John G. Steinke

PEORIA, ILL., June 11—John G. Steinke, aged 38 years, secretary-treasurer of Steinke Bros., automotive equipment manufacturers, died June 8 as the result of injuries sustained three weeks ago in a fall. He was not married. The mother, four brothers and three sisters survive. Funeral services were held this Saturday morning in the home at Deer Grove, Ill., and burial was in St. Mary's cemetery at Tampico.

Calendar of Coming Events

SHOWS

Chicago .....Nov. 7-12
Exposition, Coliseum, Automotive Equipment Association.

Chicago .....Jan. 28-Feb. 4
National, Coliseum, National Automobile Chamber of Commerce, including special Shop Equipment Exhibit.

Chicago .....Jan. 28-Feb. 4
Automobile Salon, Hotel Drake.

Cleveland .....Sept. 19-23
Exposition, Public Auditorium, National Machine Tool Builders' Ass'n.

Cleveland .....Oct. 3-7
Exhibition, Public Auditorium, American Electric Railway Ass'n.

Cleveland .....Nov. 14-19
Convention Hall, National Standard Parts Association.

Cleveland .....Jan. 9-14
American Road Builders Association.

London .....Oct. 14-22
Olympia Passenger Car Show.

London .....Nov. 17-26
Olympia Truck Show.

Los Angeles .....Feb. 11-18
Automobile Salon, Hotel Biltmore.

New Haven, Conn. .....Sept. 6-9
Machine Tool Exhibition.

New York .....Nov. 27-Dec. 3
Automobile Salon, Hotel Commodore.

New York .....Jan. 7-14
National, Grand Central Palace, National Automobile Chamber of Commerce, including special Shop Equipment Exhibit.

Paris .....Oct. 6-16
Grand Palais.

San Francisco .....Feb. 25-March 3
Automobile Salon, Hotel St. Francis.

CONVENTIONS

American Electric Railway Association, Public Auditorium, Cleveland..Oct. 3-7

American Society for Steel Treating, Convention Hall, Detroit....Sept. 19-24

American Society for Testing Materials, French Lick Springs, Ind....June 20-24

Automotive Equipment Association Summer Convention, Multnomah Hotel, Portland, Ore...June 27-July 2

Automotive Equipment Association, Coliseum, Chicago .....Nov. 7-12

International Chamber of Commerce, Stockholm .....June 27-July 2

National Association of Automobile Show and Association Managers, Drake Hotel, Chicago .....July 28-29

National Safety Council, Stevens Hotel, Chicago .....Sept. 26-30

National Standard Parts Association, Summer Meeting, Hollenden Hotel, Cleveland .....June 20-21

National Standard Parts Association, Hotel Hollenden, Cleveland..Nov. 14-19

S. A. E.

National

Chicago, November—National Transportation and Service Meeting.
Chicago, Dec. 1—Tractor Meeting.
Cleveland and Detroit, Sept. 19-22—Production Meeting.
Detroit, Jan. 24-27—Annual Meeting.
New York, Jan. 12—Annual Dinner.

RACES

Abilene, Texas .....July 4
Altoona, Pa. .....Sept. 5
Atlantic City .....Sept. 24
Belgian Grand Prix, Spa-Francorchamps .....July 9-10
British Grand Prix, Brooklands.....Oct. 1
Charlotte, N. C. .....Oct.
Detroit .....Sept. 10
French Grand Prix, Montlhery.....July 3
Los Angeles .....Nov. 27
Salem, N. H. .....June 25
Salem, N. H. .....Oct. 12
Syracuse, N. Y. .....Sept. 3